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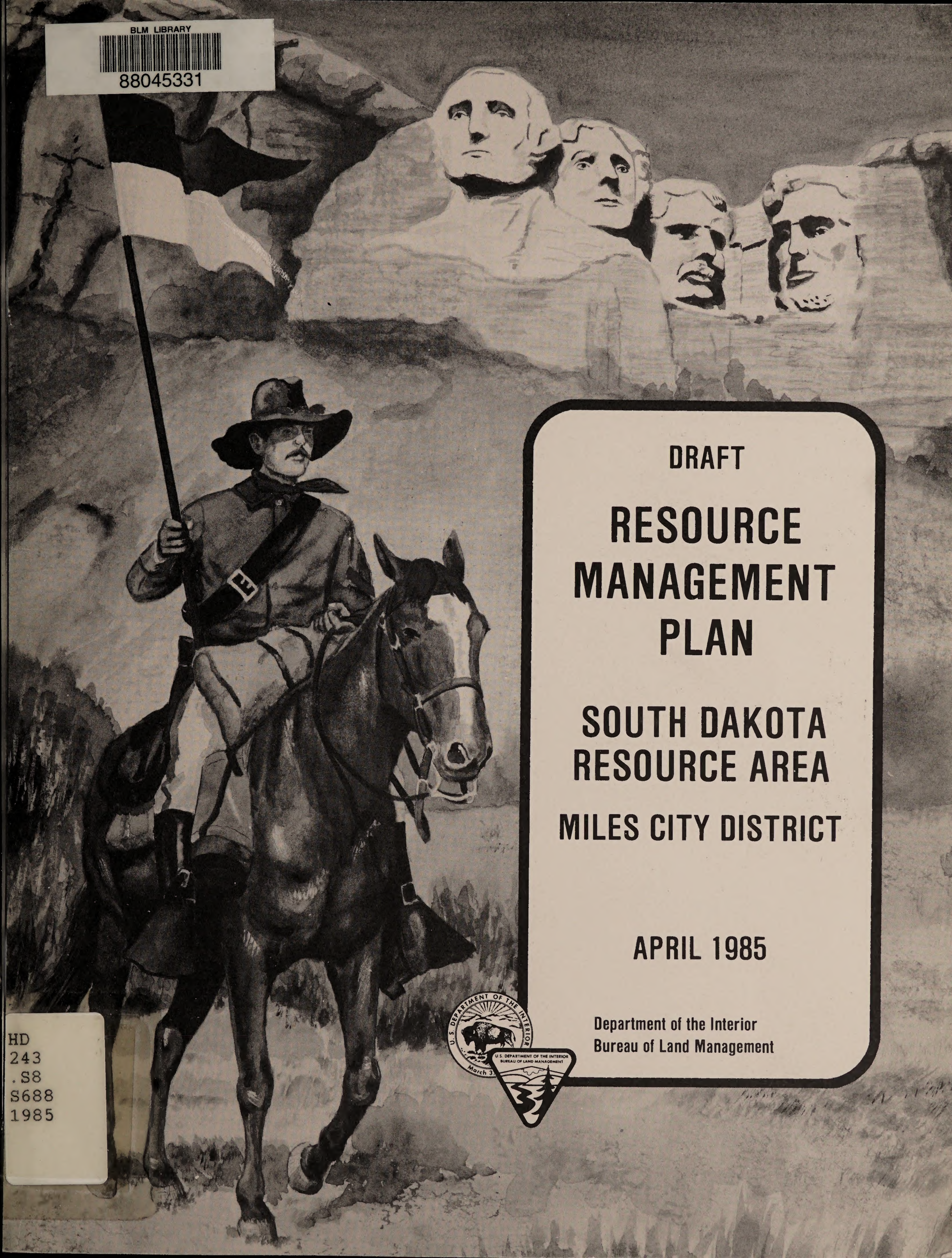

DRAFT

RESOURCE MANAGEMENT PLAN

SOUTH DAKOTA RESOURCE AREA

MILES CITY DISTRICT

APRIL 1985

Department of the Interior
Bureau of Land Management

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1985

BLM-MT-ES-85-007-4410

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To The Reader:

This draft Resource Management Plan/Environmental Impact Statement (RMP/EIS) for the South Dakota Resource Area is presented for your review and comment. This document outlines five major alternatives for managing the public land in the South Dakota Resource Area. These alternatives are designed to resolve two land management issues identified during the early stages of the planning process.

We would appreciate your comments on this RMP/EIS by July 26, 1985. Questions or comments should be directed to Chris Roholt, Project Manager, Miles City District Office, Bureau of Land Management, P.O. Box 940, Miles City, Montana 59301 or Billy McIlvain, Area Manager, South Dakota Resource Area, 510 Roundup Street, Belle Fourche, South Dakota 57717.

A formal public meeting has been scheduled to allow individuals to present testimony on the draft RMP/EIS.

The meeting will be held at the following location:

Date	Location	Time
Wednesday, May 22, 1985	Belle Fourche Community Hall 508 6th Avenue Belle Fourche, South Dakota	1:30 pm-4:30 pm and 7:30 pm-9:00 pm

All comments, whether written or oral, will be given equal consideration in the preparation of the final Resource Management Plan/Environmental Impact Statement. I hope that through your participation in this effort we can move together toward a common goal of improved public land management in the South Dakota Resource Area.

Sincerely yours,

Dean Stepanek

Dean Stepanek
State Director

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RESOURCE MANAGEMENT PLAN ENVIRONMENTAL IMPACT STATEMENT

For The

SOUTH DAKOTA RESOURCE AREA
MILES CITY DISTRICT, MONTANA

APRIL 1985

Prepared By

BUREAU OF LAND MANAGEMENT
DEPARTMENT OF THE INTERIOR

Dean Stepanek

State Director

Montana State Office

RESOURCE MANAGEMENT PLAN
ENVIRONMENTAL IMPACT STATEMENT

Draft (X) Final( )

LEAD AGENCY: SOUTH DAKOTA RESOURCE AREA
MILES CITY DISTRICT OFFICE, MILES CITY, MONTANA
BUREAU OF LAND MANAGEMENT
U.S. DEPARTMENT OF THE INTERIOR

Type of Action

Administration (X) Legislative ( )

ABSTRACT

The Draft Resource Management Plan/Environmental Impact Statement (DEIS) addresses future management options for 280,672 surface acres and 5,294,122 mineral acres of public domain administered by the Bureau of Land Management, Miles City District, South Dakota Resource Area, located in Belle Fourche, South Dakota. The plan focuses on alternative approaches to management of two key issues, which are vegetation apportionment and lands actions. Four alternatives plus a preferred alternative, derived from the four alternatives, are discussed in detail. The four alternatives are based on no action which is the continuation of the present resource protection and two levels of management intensity.

Comment Period This Draft Resource Management Plan/Environmental Impact Statement is open to public comment during the period of April 26, 1985 through July 26, 1985. On May 22, 1985 a public meeting will be held in Belle Fourche, South Dakota for oral comments. Questions and written comments should be directed to:

Chris Roholt, Project Manager
Miles City District Office
Bureau of Land Management
P. O. Box 940
Miles City, Montana 59301
Telephone (406) 232-4331

Billy McIlvain, Area Manager
South Dakota Resource Area
Bureau of Land Management
510 Roundup Street
Belle Fourche, South Dakota 57717
Telephone (605) 892-2526

SUMMARY

The South Dakota Resource Management Plan (RMP) addresses future management for approximately 280,672 surface acres and 5,294,122 acres of federal mineral estate administered by the Bureau of Land Management (BLM) through its South Dakota Resource Area Office in Belle Fourche, South Dakota. The emphasis of the plan centers around 13 counties which includes 278,673 surface acres in Brule, Butte, Custer, Fall River, Haakon, Harding, Jackson, Lawrence, Lyman, Meade, Pennington, Perkins,and Stanley counties. All the counties, except Brule County, are west of the Missouri River.

This document consists of five chapters. Chapter 1 is a summarization of the planning process and the major issues identified through the public involvement process and by BLM resource specialists. Chapter 1 also discusses ongoing resource programs that will not be affected and are not examined elsewhere in this document as well as the management responsibilities common to all alternatives.

Chapter 2 presents the five alternatives involving two issues. The issues discussed in this chapter are vegetation apportionment and lands actions. The chapter ends with a summary of the cumulative environmental impacts.

Chapter 3 is a description of the physical setting of the South Dakota Resource Area and those resources present which could be affected by decisions made in this resource management plan.

Chapter 4 is a detailed discussion of the potential environmental impacts resulting from implementing each of the alternatives. The chapter begins with the resources for which impacts would not vary by alternative. This is followed by a discussion of the potential resource impacts by alternative.

Chapter 5 summarizes the public involvement process and gives a listing of the agencies, organizations and individuals consulted during the planning process.

The five alternatives and the environmental impacts are briefly summarized below.

Preferred Alternative

Changes in grazing management, range improvements, and mechanical treatment would result in 31,783 acres of fair condition range on "M" or "I" allotments improving to good or better condition. A total of 7,372 acres, regardless of condition, has the potential to be converted to tame pasture. Exclusion of livestock from 1,331 acres of riparian areas and deferment of grazing on 6,082 acres of fragile soils would accelerate improvements in range condition.

There would be insignificant windborne soil losses of 245 acre feet associated with project construction and mechanical treatments, However, soil conditions would improve and sediment loads would decrease as range condition improves. These beneficial effects would be accelerated on the areas of mechanical treatment, tame pasture conversion, riparian areas, and fragile soils.

Subject to monitoring, there would be 31 "M" and "I" category allotments receiving increases and 21 "M" and "I" category allotments receiving decreases in authorized use. The net result would be an 11.2 percent increase in livestock use of 5,062 AUMs from the current level of 45,305. There would be no change in 376 "C" category allotments.

Forage available for wildlife would increase 11,705 AUMs or 10.1 percent.

Of the 280,672 surface acres of public land in South Dakota, 85,000 acres or 30 percent would be categorized with potential for disposal. Disposal would include 5 percent sales and 95 percent exchanges. Land categorized for disposal are primarily small, scattered isolated tracts unusable by the public and inefficient to manage as part of the public land system. Most lands would be considered for exchange to consolidate larger tracts, gain public access to other tracts and acquire lands with greater public resource value such as lands along major river drainages and reservoirs. Sales would be used to a lesser extent to reduce administrative costs and improve the land ownership pattern. Cumulatively, exchanges would result in beneficial impacts while sales at a low level would result in a small reduction of the public land resource.

Alternative A

Grazing management would result in 31,783 acres of fair condition range on "M" or "I" allotments improving to good or better condition.

There would be insignificant windborne soil losses of 9 acre feet associated with water project replacement or repair. However, soil conditions would improve and sediment loads would decrease as range condition improves.

There would be no change in the allotments. Forage available for wildlife would increase 12,184 AUMs or 10.5 percent.

Of the 280,672 surface acres of public land in South Dakota, 20,000 acres or 7 percent would be categorized with potential for disposal. Disposal would include 25 percent sales and 75 percent exchanges. Land categorized for disposal are primarily small, scattered isolated tracts unusable by the public and inefficient to manage as part of the public land system. Most lands would be considered for exchange to consolidate larger tracts, gain public access to other tracts and acquire lands with greater public resource value such as lands along major river drainages and reservoirs. Sales would be used to a lesser extent to reduce administrative costs and improve the land ownership pattern. Cumulatively, exchanges would result in beneficial impacts while sales at a low level would result in a small reduction of the public land resource.

Alternative B

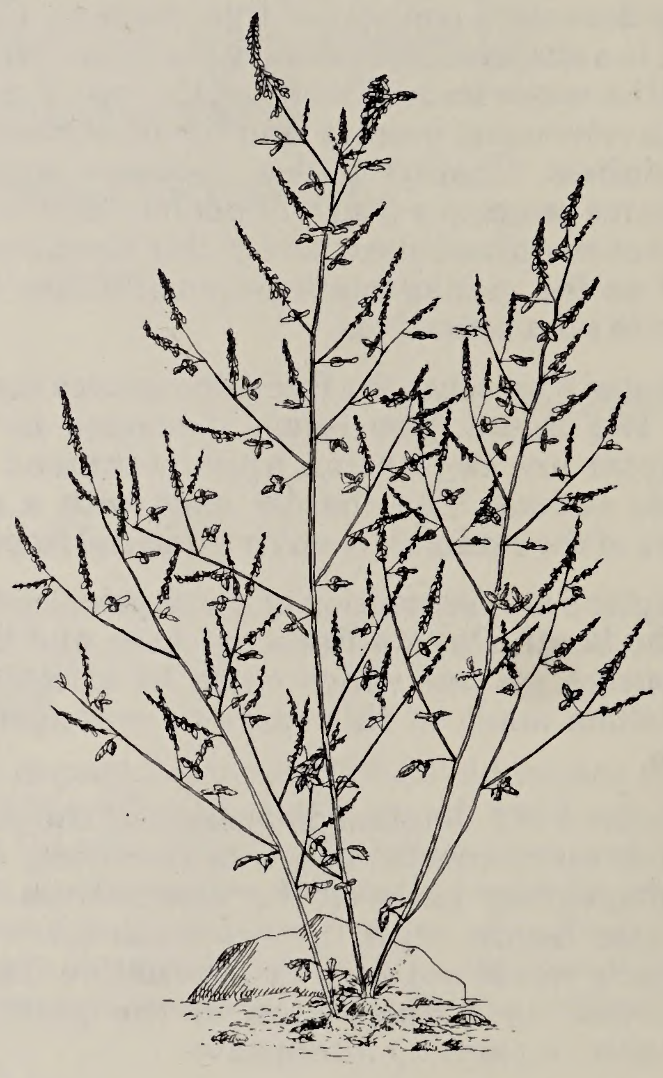
Changes in grazing management, range improvements, and mechanical treatment would result in 31,783 acres of fair condition range on "M" or "I" allotments improving to good or better condition.

There would be insignificant windborne soil losses of 59 acre feet associated with project construction and mechanical treatments. However, soil conditions would improve and sediment loads would decrease as range condition improves. These beneficial effects would be accelerated on the areas of mechanical treatment.

Subject to monitoring, there would be 30 "M" and "I" category allotments receiving increases and 37 "M" and "I" category allotments receiving decreases in authorized use. The net result would be a 5.2 percent decrease in livestock use of 2,371 AUMs from the current level of 45,305. There would be no change in 376 "C" category allotments.

Forage available for wildlife would increase 12,699 AUMs or 10.9 percent.

Of the 280,672 surface acres of public land in South Dakota, 85,000 acres or 30 percent would be categorized with potential for disposal. Disposal would include 5 percent sales and 95 percent exchanges. Land categorized for disposal are primarily small, scattered isolated tracts unusable by the public and inefficient to manage as part of the public land system. Most lands would be considered for exchange to consolidate larger tracts, gain public access to other tracts and acquire lands with greater public resource value such as lands along major river drainages and reservoirs. Sales would be used to a lesser extent to reduce administrative costs and improve the land ownership pattern. Cumulatively, exchanges would result in beneficial impacts while sales at a low level would result in a small reduction of the public land resource.



Yellow Sweetclover

Alternative C

Changes in grazing management, range improvements, and mechanical treatment would result in 31,783 acres of fair condition range on "M" or "I" allotments improving to good or better condition. A total of 8,115 acres, regardless of condition, has the potential to be converted to tame pasture.

There would be insignificant windborne soil losses of 261 acre feet associated with project construction and mechanical treatments. However, soil conditions would improve and sediment loads would decrease as range condition improves. These beneficial effects would be accelerated on the areas of mechanical treatment and tame pasture conversion.

Subject to monitoring, there would be 45 "M" and "I" category allotments receiving increases and 23 "M" and "I" category allotments receiving decreases in authorized use. The net result would be a 26 percent increase in livestock use of 12,207 AUMs from the current level of 45,305. There would be no change in 376 "C" category allotments.

Forage available for wildlife would increase 14,154 AUMs or 12 percent.

Of the 280,672 surface acres of public land in South Dakota, 85,000 acres or 30 percent would be categorized with potential for disposal. Disposal would include 5 percent sales and 95 percent exchanges. Land categorized for disposal are primarily small, scattered isolated tracts unusable by the public and inefficient to manage as part of the public land system. Most lands would be considered for exchange to consolidate larger tracts, gain public access to other tracts and acquire lands with greater public resource value such as lands along major river drainages and reservoirs. Sales would be used to a lesser extent to reduce administrative costs and improve the land ownership pattern. Cumulatively, exchanges would result in beneficial impacts while sales at a low level would result in a small reduction of the public land resource.

Alternative D

Changes in grazing management, range improvements, and mechanical treatment would result in 31,783 acres of fair condition range on "M" or "I" allotments improving to good or better condition. A total of 6,725 acres, regardless of condition, has the potential to be converted to tame pasture. Exclusion of livestock from 1,560 acres of riparian areas and deferment of grazing on 29,306 acres of fragile soils would accelerate improvements in range condition.

There would be insignificant windborne soil losses of 227 acre feet associated with project construction and mechanical treatments. However, soil conditions would improve and sediment loads would decrease as range condition improves. These beneficial effects would be accelerated on the areas of mechanical treatment, tame pasture conversion, riparian areas, and fragile soils.

Subject to monitoring, there would be 38 "M" and "I" category allotments receiving increases and 30 "M" and "I" category allotments receiving decreases in authorized use. The net result would be an 18.1 percent increase in livestock use of 8,188 AUMs from the current level of 45,305. There would be no change in 376 "C" category allotments.

Forage available for wildlife would increase 21,357 AUMs or 18.4 percent.

Of the 280,672 surface acres all would be identified for retention. There would be a lack of opportunity to consolidate scattered tracts, to improve public benefits, and increase management efficiency.

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PURPOSE AND NEED FOR ACTION

INTRODUCTION

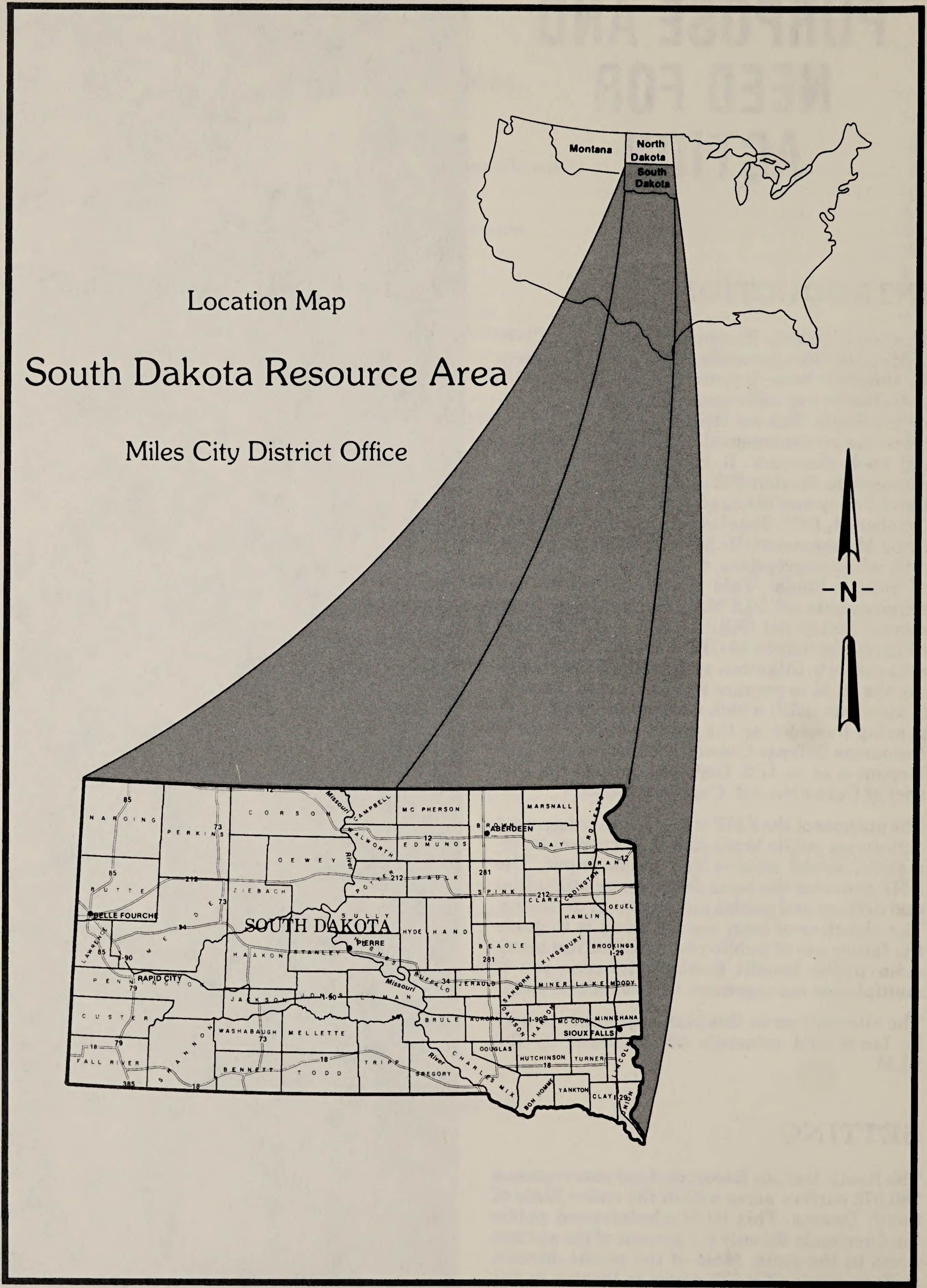
The South Dakota Resource Management Plan (RMP) describes general management direction for the short term (5 years) to the long term (15 years) for two specific issues and other activities in the South Dakota Resource Area and analyzes the environmental effects of implementing such direction. It has been prepared in response to Section 202 and 603 of the Federal Land Policy and Management Act (FLPMA) of October 21, 1976. This law directs the Bureau of Land Management (BLM) to develop, maintain and, when appropriate, revise plans for the use of public lands. This document meets the requirements of FLPMA, National Environmental Policy Act (NEPA), and land use planning regulations in 43 CFR Part 1600. Also, it is responsive to litigation against the BLM requiring the BLM to prepare Environmental Impact Statements (EIS) which address the impacts of grazing livestock on the public lands, (Natural Resources Defense Council et al vs. Rogers C. B. Morton et al vs. U.S. District Court for the District of Columbia, ref. Case No. 1983-73).

The purpose of the RMP is to guide management actions on public lands based on current information, sound criteria and public input. The RMP provides the basis for resource utilization and defines and guides management decisions. The objective of land use planning is to guide the future use of public resources for the maximum public benefit through the concepts of multiple-use management and sustained yield.

The alternatives in this plan apply only to public lands and minerals administered by the BLM.

SETTING

The South Dakota Resource Area encompasses 280,672 surface acres within the entire State of South Dakota. This BLM-administered public land accounts for only 0.5 percent of the surface acres in the state. Most of the public domain surface estate (278,673 acres) is located in the western half of the state in the counties



Location Map

South Dakota Resource Area

Miles City District Office

MAP 1-1

of: Brule, Butte, Custer, Fall River, Haakon, Harding, Jackson, Lawrence, Lyman, Meade, Pennington, Perkins, and Stanley counties (Map 1-1). In addition, BLM has management responsibilities for 5,294,122 acres of subsurface minerals (including minerals in the Black Hills National Forest, the Buffalo Gap National Grasslands, the Custer National Forest, the Ft. Pierre National Grasslands and the Grand River National Grasslands). Surface and subsurface ownership is generally in a fragmented pattern due to a complex history of homestead grants. (See Resource Management Plan Map in map pocket.) The situation where coal is the only federal mineral reserved was as a result of patenting under the Enlarged Homestead Act of 1909. Lands where all minerals are federally owned are either public domain or lands whose surface was patented under the Stock Raising Homestead Act of 1916.

The primary economic use of public domain surface estate in the Resource Area is rangeland. Other significant land uses include wildlife habitat, watershed and recreation.

The major trade center in the western counties is Rapid City, with a 1980 census of 50,882 people. Other population centers include Belle Fourche, Spearfish, Sturgis, Buffalo, Hot Springs, Deadwood-Lead, Custer, Bison, Phillip, Kadoka, and Pierre.

HISTORICAL BACKGROUND

The oldest records are preserved in the geologic formations of the Resource Area (see Table 1-1). South Dakota was dominated by a series of inland marine seas, which deposited thousands of feet of sediment and in age range from 70 to 500 million years. The Black Hills were uplifted along with the Rocky Mountains 55 to 60 million years ago. Formation of the mountains allowed erosional forces to take over as the marine seas subsided and streams carved valleys, washing away sedimentary layers to expose the basement granites and other bedrocks in the Black Hills. The present features in western South Dakota consist of the sedimentary formations exposed in the valleys and benches and remnants being exposed along the major rivers and streams.

The Resource Area was first inhabited by nomadic hunters about 11,000 years ago. Throughout most of prehistory, the area supported band-level societies oriented toward hunting bison and other herbivores. As American populations expanded westward, some Indian groups living in the midwest were pushed onto the plains, where they adopted a nomadic lifestyle and displaced resident peoples. These late immigrant peoples were the historic tribes known to have lived in the area, including the Kiowas, Shoshone, Arapahoe, Cheyenne and Sioux.

Exploration of the Resource Area began as traders contacted the Missouri River village tribes in the last half of the 18th century and eventually took their trade west. Military expeditions for Indian control and scientific purposes were conducted from the 1830's through the 1870's. The 1874 exploration of the Black Hills region, led by Col. George A. Custer, sparked a gold rush and subsequent settlement.

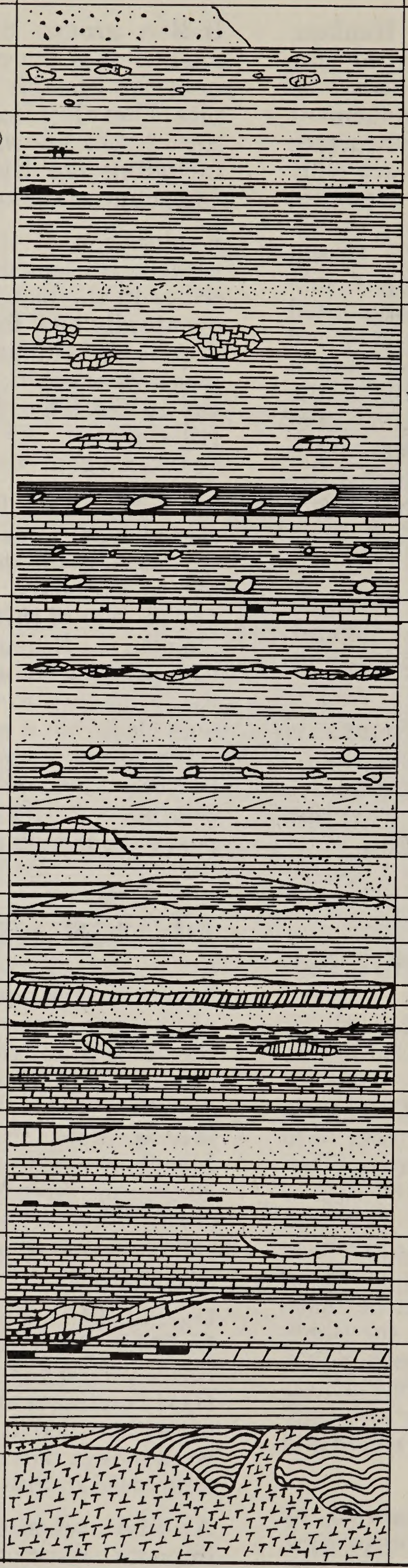
Since the Black Hills and surrounding plains region was home for these Indian tribes, the invasion by prospectors, settlers, and travelers led to serious disputes, including the Sioux Indian War of 1876. Some events of the war took place in the Resource Area. In 1878, Fort Meade was selected as a military post to protect the roads leading to the Black Hills. Fort Meade was closed as a military post and jurisdiction was transferred to the Veterans Administration in 1947. Since 1954, all but 1,159 acres of the original 7,730 acres of the Fort Meade military post were transferred to BLM jurisdiction.

PLANNING OVERVIEW

Several years ago, the BLM instituted a planning process centered around development of Resource Management Plans (RMPs) to guide management decisions affecting public resources. Prior to this, BLM prepared the Fort Meade Management Framework Plan (1973), Fort Meade Recreation Area Plan (1981) and the Exemption Area Management Framework Plan (1976). These plans are hereby incorporated by reference into this document and summarized in Appendix G.

During 1979, as mandated by Section 603(a) of FLPMA, all BLM administered lands were inventoried for wilderness characteristics. Based on this review, no wilderness study areas were identified in the Resource Area. Therefore, wilderness review processes will not be addressed in this plan.

An environmental assessment of the potential impacts associated with land management proposals is a major portion of this plan. The planning process described in the BLM planning regulations 43 CFR Part 1600 consists of the following nine steps:



	FORMATION	SECTION	THICKNESS IN FEET	DESCRIPTION
QUATERNARY	SANDS AND GRAVELS		0 - 50	Sand, gravel, and boulders.
MIOCENE AND OLIGOCENE	ARIKAREE FORMATION WHITE RIVER GROUP		0 - 1150	Sand, gravel, clay, fuller's earth, sandstone, and limestone
PALEOCENE	(Cannonball Marine Member) FORT UNION FORMATION (Ludlow Lignitic Member)		(0 - 225) (0 - 335)	Dark, fine-grained sandstone and shale. Yellowish to gray sandstone, clayey sandstone, shale and lignite.
UPPER CRETACEOUS	HELL CREEK FORMATION		425	Somber-colored soft brown shale and gray sandstone, with thin lignite lenses in upper part. Lower half more sandy. Many loglike concretions and thin lenses of iron carbonate.
	FOX HILLS SANDSTONE		25 - 200	Grayish-white to yellow sandstone.
	PIERRE SHALE		1200 - 2500	Principle horizon of limestone lenses giving tepee buttes. Dark-gray shale containing scattered concretions. Widely scattered limestone masses, giving small tepee buttes. Black fissile shale with concretions.
	NIOBRARA LIMESTONE		100 - 225	Impure chalky limestone and slate.
	Wall Creek Sands CARLILE SHALE		400 - 800	Light-gray shale with numerous large concretions and sandy layers. Dark-gray shale.
	GREENHORN LIMESTONE		25 - 80	Impure slabby limestone. Weathers buff.
?	Belle Fourche Shale GRANEROS SHALE Mowry Shale New Castle (Muddy) s.s. Skull Creek Shale		(500 - 850) 800 - 1250 (150 - 250) (20 - 60) (150 - 300)	Dark-gray to black clayey shale. Sandy shale. Large calcareous concretions. Some bentonite. Thin limestone beds. Hard light-gray sandy shale. Fish scales. Bentonite. Reddish to light yellow sandstone. Dark-gray to black clayey shale. Concretions. Some sandstone.
LOWER CRETACEOUS	DAKOTA SANDSTONE		10 - 200	Massive sandstone. Weathers brown.
	FUSON SHALE		10 - 188	Gray to purple shale. Thin sandstone.
	MINNEWASTE LIMESTONE		0 - 25	Massive gray limestone.
	LAKOTA SANDSTONE		25 - 485	Coarse, hard, crossbedded sandstone mostly buff to gray. Conglomerate locally and coal at base.
JURASSIC	MORRISON FORMATION		0 - 220	Maroon to green shale. Thin sandstone
	UNKPAPA SANDSTONE		0 - 255	Soft, massive, fine grained sandstones.
	SUNDANCE FORMATION		70 - 450	Greenish-gray shale, small ss. and ls. lenses, buff sandstone, red sandstone and shale.
	GYPSUM SPRINGS FORMATION		0 - 45	Gypsum and red shale grading to dolomite.
	NUGGET ? FORMATION		0 - 60	Massive cross-bedded salmon-colored sandstone.
TRIASSIC ? PERMIAN	SPEARFISH FORMATION		350 - 700	Red sandy shale, soft red sandstone and siltstone, with gypsum layers. Gypsum locally near base.
	MINNEKAHTA LIMESTONE		30 - 50	Massive gray, laminated limestone.
?	OPECHE FORMATION		50 - 135	Red shale and sandstone.
PENNSYLVANIAN	MINNELUSA SANDSTONE		300 - 850	Red, cross-bedded sandstone, limestone locally at the top. Interbedded sandstone, limestone, and shale. Sandstone with interbedded limestone, red shale at base.
MISSISSIPPIAN	PAHASAPA SANDSTONE		300 - 630	Massive light colored limestone. Dolomitic in part.
	ENGLEWOOD LIMESTONE		30 - 60	Pink to buff limestone. Shale locally at base.
ORDOVICIAN	WHITEWOOD FORMATION ?		0 - 130	Massive buff limestone underlain by sandstone, siltstone, and gray-green shale.
UPPER CAMBRIAN	DEADWOOD FORMATION		10 - 500	Massive to buff sandstone. Greenish glauconitic shale, flaggy dolomite and flat-pebble limestone conglomerate. Sandstone, with conglomerate locally at the base.
PRECAMBRIAN	Metamorphic and Igneous Rocks			Schist, slate, quartzite, and arkosic grit. Intruded by diorite, metamorphosed to amphibolite, and by granite and pegmatite.

From Dept. of Geology, S.D. State School of Mines - 1950

Black Hills generalized columnar section.

TABLE 1-1

Step 1. Identification of Issues

The public, other federal agencies, and state and local governments were asked to identify public land management issues in the Resource Area through mailouts. An Open House was held July 12, 1982, followed by various meetings with state, federal and other officials and interested parties. BLM also identified issues and management concerns.

Step 2. Development of Planning Criteria

BLM developed planning criteria to identify the considerations and constraints that would be applied to the analysis throughout the planning process.

Step 3. Inventory and Data Collection

Resource specialists reviewed base data from existing and updated inventories and completed new ones. Existing plans were also reviewed to analyze recommendations, decisions and directives.

Step 4. Management Situation Analysis

This step analyzed the resources in relation to issues and concerns. It described the resources that would be affected in the plan, explained how the resources are currently being managed and listed options for future management. The Management Situation Analysis (MSA) also was used in developing the alternatives chapter (Chapter 2) and the affected environment chapter (Chapter 3). The complete MSA is on file for reference at the BLM Miles City District and South Dakota Resource Area Offices.

Step 5. Alternative Formulation

Options arising from the MSA were used to formulate a set of four initial alternatives. Management levels were developed to portray how the various resources would be used under changing program priorities. Specific actions proposed under each issue and alternative level were developed.

Step 6. Assessment of Alternatives

Resource specialists then described the environmental consequences of each level of resource use including biological, physical, economic and social effects.

This step is the environmental analysis required by the National Environmental Policy Act and is presented in Chapter 4.

Step 7. Selection of Preferred Alternative

The Preferred Alternative identified in Chapter 2 was formulated based on: 1) issues identified through the planning process; (2) criteria developed and considered by management; and (3) analysis of the impacts associated with the specific recommendations in each of the four alternatives. It was also analyzed for environmental impacts as described in Step 6 and is the primary focus of this document.

Step 8. Selection of Resource Management Plan

The eighth step is the plan selection and approval process. It will be completed following the review and incorporation of public comment on the draft RMP and will be implemented 30 days after the publication of the final RMP.

Step 9. Monitoring and Evaluation

The plan will be implemented according to the schedule included in the Record of Decision and final RMP. The implementation schedule will be subject to adjustment in relation to funding. Where additional information is needed for implementation, smaller, more focused activity plans will be developed. The effects of implementation will then be monitored and evaluated. Standards will be developed to determine the adequacy of mitigation measures, the measurement of impacts, and whether significant changes in related federal, state, or local land use plans have been made. Monitoring and evaluation reports will be available for public review.

ISSUES

Results of an internal preplanning analysis, input from the public and coordination with other governmental entities suggested two major issues to be analyzed in depth; vegetation apportionment and lands. These issues, including planning questions and criteria, were made public. The RMP steering committee, as identified in Chapter 5, finalized the two major issues.

Issue Number 1—Vegetation Apportionment

To meet its management goals of multiple use of the public lands and sustained yield of renewable resources like forage, BLM considers the vegetation requirements of watershed, wildlife and livestock. The majority of lands under BLM jurisdiction in the South Dakota Resource Area are grasslands (see Chapter 3, Range). The forage produced here is a public resource which has traditionally been used for livestock grazing. Area ranchers who lease grazing privileges, derive economic benefits from the public lands proportionate to the amount of forage under lease.

Based on current information the allotments have been categorized as to the type of management they should receive. Categorization criteria were those shown in BLM Manual 1621 and 4100; e.g. resource potential, resource use conflicts or controversy, opportunity for positive economic return, the present management situation, and other criteria as appropriate (USDI-BLM 1984, USDI-BLM 1983).

Three management categories have been developed by the BLM. They are:

(1) Maintenance category (M)—objective is to maintain current resource condition.

(2) Improve category (I)—objective is to improve the current resource condition.

(3) Custodial category (C)—objective is to custodially manage the existing resource values.

Planning Questions

What should be the apportionment of vegetation resources to livestock grazing, watershed, and wildlife forage and cover?

Criteria

Vegetation is to be apportioned to livestock, watershed, and wildlife in a manner that will improve or maintain the condition of the vegetation and soil resources.

Issue Number 2—Lands

Many parcels of land administered by the BLM in South Dakota are small, isolated tracts which result in a fragmented ownership pattern. Lack of legal access and small size present an inefficient resource to manage.

Some land ownership adjustment is necessary to enhance the objectives of multiple use and sustained yield of renewable resources on public lands.

Planning Questions

What opportunities are available to reposition public lands and increase public access to them?

What opportunities are available to acquire lands with high public value?

Criteria

Consideration will be given to the public values in repositioning public lands. This includes consideration of:

—Ownership patterns

—Existing and potential uses of surrounding land;

—Existing and potential access to lands;

—Existing possibilities;

—Priority to gain access which will be given to those lands having significant existing or potential public values; and

—Incorporation of the principles of land pattern adjustment developed in Montana State Director guidance.

2

ALTERNATIVES

ALTERNATIVE FORMULATION OVERVIEW

Both the National Environmental Policy Act (NEPA) regulations and the BLM resource management planning regulations (43 CFR 1610.4-5) require the formulation of alternatives. Each alternative represents a complete and reasonable plan to guide future management of public land and resources. One required alternative must represent no action which means a continuation of present levels or systems of resource use. The other alternatives must provide a range of choices from resource protection to resource production.

The basic goal in formulating alternatives is to identify combinations of public land uses and resource management practices that respond to the issues.

Alternatives to resolve the two issues of vegetation apportionment and lands were formed around four general themes: no action which is continuation of present management; extensive management of all resources; intensive management with an emphasis on the range resource; and resource protection.

The alternative management plans in this document reflect various emphases in vegetation approtioned to livestock and that retained for watershed and wildlife forage and cover. The amount of mechanical land treatment varies with the intensity of management anticipated under each alternative. Possible range improvements include construction of facilities to enhance livestock distribution (e.g., reservoirs and other water sources and fences) and forage production (e.g., mechanical treatment). Under each alternative, mananagement objectives for public lands are established by the management category into which the land falls.

Issues dictated the way in which alternatives were formulated. Lands, resources, and programs administered by the BLM are proposed for changes in management based on the preferred means of resolving all issues. Those lands, resources, and programs not affected by the resolution of any issue will continue to be managed in the future essentially as they are at present. Future changes will be permitted based on case-by-case analyses and in accordance with applicable laws, regulations, and policies.

ALTERNATIVE ELIMINATED FROM DETAILED STUDY

The following alternative was considered as a possible method of resolving specific issues, but was eliminated from detailed study because it proved unreasonable.

No Grazing

The elimination of livestock grazing from the public lands did not surface as an issue during the scoping process; however, it was considered as a possible method of resolving the vegetation apportionment issue. Based on interdisciplinary analysis, the no grazing alternative was eliminated. Resource conditions (vegetation, watershed and wildlife habitat) do not warrant an areawide prohibition of livestock grazing. This is supported by the fact that 77.3 percent of lands suitable for grazing are in good or excellent condition. (See Table 2-1.)

Other reasons this alternative was not analyzed are: (1) the highly fragmented pattern of public lands in the Resource Area, which would necessitate extensive fence construction and maintenance to effectively exclude livestock from the public land. Fencing would not only be extremely costly, but also would disrupt wildlife movement and affect public access; (2) the overall economic and social impacts of no grazing were considered unacceptable.

In summary, implementation of a no grazing alternative is not considered to be feasible or necessary. A complete description of the no grazing alternative, as well as the environmental consequences of such an action, is contained in Appendix A.

MANAGEMENT GUIDANCE COMMON TO ALL ALTERNATIVES

The following management guidance is applicable to, and thus constitutes a part of, all alternatives considered in detail and is subject to the availability of funding and manpower. It is presented here to avoid repetition.

Vegetation Apportionment Issue

Vegetation has been apportioned to various uses and resources. Specific apportionments have been made to livestock and other resources such as watershed maintenance, soils protection and wildlife.

Watershed maintenance and the soils resource require a minimum amount of ground cover to prevent soil erosion and sedimentation problems. Also, the time of year when certain soils are grazed is critical. Wildlife require certain types of vegetation for habitat needs as well as

TABLE 2-1
OVERALL RANGE CONDITION ACRES BY ALLOTMENT CATEGORY

Categorization	Excellent	Good	Fair	Unknown[1]	Unsuitable For Livestock[2]	Grand Total
Maintain (M)	7,645 (6%)	91,560 (66%)	15,843 (11%)	—	23,450 (17%)	138,498 (50%)
Improve (I)	655 (2%)	7,581 (26%)	15,896 (55%)	—	4,963 (17%)	29,095 (11%)
Custodial (C)	14,805 (14%)	63,828 (61%)	14,172 (14%)	8,847 (8%)	3,336 (3%)	104,988 (39%)
TOTALS	23,105	162,969	45,911	8,847	31,749	272,581
Percent of All Public Land	8.5	59.9	16.8	3.2	11.6	100
Percent of Grazable Land	9.6	67.7	19.0	3.7	—	100

[1] Condition class is unknown on these areas.

[2] There are rock outcrop, barren areas and water which is not suitable for livestock grazing.

Source: BLM, 1984

for forage. These requirements are all considered when apportionments are being made and when grazing systems are being established. These are a few examples that show how vegetation apportionment and grazing management have an effect on these resources.

The other resources discussed in this chapter, such as: lands, cultural resources, forestry, paleontology, recreation and minerals, are resources that are not directly related to vegetation apportionment but are considered in multiple-use management. Management actions that may occur as a result of vegetation apportionment may affect these resources, so they are looked at before any on-the-ground actions are implemented (e.g., range improvement construction and mechanical treatment).

Vegetation Monitoring and Evaluation

The actions outlined in the South Dakota RMP will be implemented over a period of 15 years or more. The effects of implementation will be monitored and evaluated over the life of the plan. The general purposes of monitoring and evaluation will be:

(1) To determine if an action is meeting the objective for which it was designed;

(2) To determine unanticipated effects;

(3) To determin if changes in management actions are needed;

(4) To determine if mitigation measures are working as prescribed; and

(5) To provide for continuing comparison of plan benefits versus costs, including social, economic, and environmental.

A monitoring plan will be written for the wildlife, watershed, and grazing management programs. This plan will provide a framework for choosing the study methods that will yield information needed to develop and implement management for the watershed, wildlife, and range resources. Monitoring efforts will focus on allotments in the improve category. The data provided by these studies will be used to evaluate stocking rates, to schedule pasture moves, to determine levels of forage competition, to detect changes in plant communities, and to identify patterns of forage use.

The monitoring intensity of an allotment will be determined by the nature and severity of the resource problems or conflicts that are present. There would be no grazing adjustments made unless adequate monitoring indicated that an adjustment of livestock use would best resolve the resource problem.

Wildlife monitoring will consist of temporary and permanent studies. They will monitor habitat condition and trend; forage availability, composition and vigor; changes in cover and habitat effectiveness; and habitat management objective accomplishment.

Watershed resource monitoring will involve measuring soil erosion. Trends in streambank stability and water quality will be studied with respect to impacts from grazing, mining and forestry activities.

Specific monitoring plans for other programs will be developed if the need arises.

The data collected from the monitoring and evaluation process will provide information regarding the effects of the management actions being taken. If monitoring indicates that significant adverse impacts are occurring or that mitigation measures are not working as desired, management actions would be changed to accomplish objectives. If monitoring indicated that management actions are successfully meeting objectives, the level of monitoring would be reduced.

Categorization of Rangelands

Criteria shown in Chapter One were applied to each allotment prior to alternative development. The result of categorization was: 55 allotments in the maintain category, 13 allotments in the improve category, and 376 allotments in the custodial category.

The total acreage of public land in each management category and range condition class is shown in Table 2-1.

The alternatives will discuss changes in management intensity, resultant changes in range condition and trend, potential land treatments and range improvements that will apply to these allotments.

When vegetation apportionments are discussed in the alternatives, those apportionments pertain to only the M and I category allotments, since no management changes are proposed for the C allotments. The total grazing preference on C allotments is 28,473 AUMs.

There would be no yearlong leases on M or I allotments. Grazing leases would define livestock numbers, class, and seasons.

Prairie Dog and Noxious Weed Control

Prairie dog towns on public land will be inventoried and examined on an as needed basis for presence of associated wildlife species, including those listed as threatened or endangered.

Cooperative studies with other agencies, universities and private groups to accomplish inventories and ecological studies would continue. Where prairie dogs are known to damage public and adjoining private rangelands, management would occur on a case-by-case basis. Sites are first examined for presence of species of concern or threatened or endangered species.

Noxious weeds would be controlled in accordance with BLM policy and South Dakota state law on a case-by-case basis. This would be done in cooperation with range users and other jurisdictions. Biological control would be considered if proven effective. Special precautions would be taken with the use of herbicides around water sources and crucial wildlife habitat.

Range Improvements

Soil and water resources would continue to be evaluated as a part of project level planning. Such evaluations consider the significance of a proposed range improvement project and the sensitivity of soil and water resources. Stipulations would be attached as needed to protect adjacent resources. Soils would be managed to maintain productivity and minimize erosion. Water quality would be monitored and maintained or improved within state and federal standards, and state agencies would be consulted on proposed projects that may significantly affect water quality.

Prior to the approval of all proposed range improvement projects, an interdisciplinary inspection would be done to evaluate the feasibility and impacts of the proposed developments. Recommendations and mitigations are discussed in the field to overcome problems that may exist and these considerations are then taken into account before final approval of the project is given.

Mitigating measures for resource protection on project developments would be as follows:

> Soils—Soil specialists identify various chemical and physical properties of the soils in relation to the type of project being proposed. If these soils properties are not adequate, it would be recommended that the project be relocated to a favorable site.
>
> Cultural—Cultural specialists conduct ground inventories to determine if any sites are present which might be eligible for the National Register of Historic Places. As part of the design and construction of range improvements, federal regulations (36 CFR 800) require consideration of the effects of a federal undertaking on sites eligible to the National Register of Historic Places. Determinations of eligibility to the Register and evaluation of effect are made in consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Officer. Protective measures for Register eligible sites can include avoidance, mitigation through data retrieval, and preservation.
>
> Range—Range specialists identify the location for the project and analyze the vegetative and livestock impacts.
>
> Hydrology—Impacts to holders of senior water rights would be addressed before project approval. If downstream water rights or water quality would be affected, alternate sites would be selected.
>
> Wildlife—Wildlife specialists identify the presence of threatened and endangered species, and the location of important wildlife habitat areas in relation to the proposed project site. They consider the time of year of construction in relation to the type of wildlife species in the area. Adjustments would be made considering wildlife values.

Fire Management

The normal fire season for the South Dakota Resource Area starts when the grass begins to cure in early July and extends through the middle of September. Some early fires occur in March or April after snowmelt and before green-up. These fires are usually of low intensity, but they can have a high spread rate. During the normal fire season, fires become more intense when their location is in heavier, forested fuel types.

Fire occurrence within the Resource Area including all ownerships have ranged from four to five fires in a low year to 10 to 12 fires on a high fire occurrence year.

The BLM's current management objectives are to take action on all new fires either on or threatening public lands. Fire suppression on public lands is carried out by the State of South Dakota, Division of Forestry and/or local volunteer fire departments in South Dakota.

No fires are allowed to burn unless addressed by an approved prescribed burn plan or modified suppression plan.

The prescribed fire program within the Resource Area has not been aggressively pursued in the past. There are some areas tentatively identified for prescribed burning. Prescribed burning could be used as an alternative to mechanical treatment.

Wildlife

Wildlife concerns would continue to be addressed in the potential activity plans developed for individual allotments, therefore, impacts from habitat disturbance or destruction would be minimal.

Fences would be constructed so as to minimize movement of big game, utilizing standards outlined in BLM Manual 1737.

Any mechanical treatment and tame pasture conversion proposed on big sagebrush habitat, critical to antelope and sage grouse, would be evaluated on a case-by-case basis to protect that resource. This would be accomplished in close consultation with the South Dakota Department of Game, Fish and Parks.

Wildlife concerns would be addressed on a case-by-case basis early in the discussions of any land conveyed by sale, exchange or for Recreation and Public Purpose patents. Threatened and endangered species habitat would be given special consideration before any land transactions occur.

Lands Issue

Trespass Abatement

Unauthorized uses of public land will be resolved either through termination, authorization by lease or permit, exchange or sale. Decisions will be based on consideration of the following criteria:

—the type and significance of improvements involved;

—conflicts with other resource values and uses, including potential values and uses; and

—whether the unauthorized use is intentional or unintentional.

New cases of unauthorized use generally will be terminated immediately. Temporary permits may be issued to provide short-term authorization, unless the situation warrants immediate cessation of the use and restoration of the land. Highest priority will be given to abatement of the following unauthorized uses:

—new unauthorized activities or uses where prompt action can minimize damage to public resources and associated costs;

—cases where delay may be detrimental to authorized users;

—cases involving special areas, sensitive ecosystems, and resources of national significance; and

—cases involving malicious or criminal activities.

Rights-of-Way

Currently right-of-ways are authorized under FLPMA and the Minerals Leasing Act. Right-of-way applications will continue to be approved on a case-by-case basis. Most of the present rights-of-way applications are for new construction or the upgrading of existing facilities. Rights-of-way are issued under the Mineral Leasing Act of 1920 for activities associated with minerals development and under Title V of FLPMA for all other development. Applicants are encouraged to locate new facilities within existing rights-of-way where possible.

Currently, widths of certain rights-of-way such as pipelines, telephone and electric lines, or cables are being reduced by the use of temporary permits during the construction phase.

Leases, Permits, and Easements

Legitimate uses of public land may be authorized on a case-by-case basis by permits, leases, and easements.

Land use permits may be granted for a maximum of 3 years for uses that require no extensive improvements, construction, or surface disturbance.

Leases may be granted to authorize use of public lands for long-term developments such as cultivation, small trade, or manufacturing concerns.

Easements may be authorized to assure that the use of public land by the public can be maintained and guaranteed if the land passes to private ownership. Easements may be used to protect cultural resources and threatened or endangered animal species on public and adjacent private land, if it is determined to be in the public interest.

Exchanges, Sales, Transfers and Recreational and Public Purposes

For those alternatives specifically addressing the disposal of public lands, the options available to BLM are exchanges, sales and Recreational and Public Purposes Act (R&PP) uses. The areas identified for disposal are outside the retention areas as shown on the Resource Management Plan Map in the map pocket. Adjustments to the land pattern would be made on a case-by-case basis, which would include consideration of other resource values and the public interest being served and would be contingent upon a site specific analysis.

Decisions regarding sales and exchanges would include, but not be limited to, consideration of the following factors which are not all-exclusive, but represent major factors: habitat for threatened and endangered or sensitive species, riparian areas, fisheries, nesting/breeding habitat for animals, key big game seasonal habitat, developed recreation and recreational access sites, Class A scenery, areas of geologic/paleontological interest, mineral resources, and sites eligible for inclusion on the National Register of Historic Places.

Lands exchanged must be of equal value or the values be equalized by cash payment by either party not to exceed 25 percent of the appraised value of lands or interests in lands transferred out of federal ownership.

The types of land to be acquired by the Federal government through exchange would be:

(1) Lands of cultural, historical, geological or paleontological values;

(2) Lands adjoining or surrounded by large tracts of public lands;

(3) Lands which provide improved access to large tracts of public land;

(4) Lands which through consolidation would increase management efficiency;

(5) Lands which would help meet other resource or recreation needs; and

(6) Lands which would consolidate the mineral estate.

Sales of public land would be made only to qualified applicants in accordance with Section 203 of FLPMA at not less than the appraised fair market value. Lands identified for disposal in this plan do meet the following criteria:

(1) Such tract, because of its location or other characteristics, is difficult and uneconomical to manage as part of the public lands, and is not suitable for management by another federal department or agency; or

(2) Such tract was acquired for a specific purpose and the tract is no longer required for that or any other federal purpose; or

(3) Disposal of such tract will serve important public objectives, including but not limited to, expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than public land and which outweigh other public objectives and values including, but not limited to, recreation and scenic values, which would be served by maintaining such tract in federal ownership. In addition, State Director guidance requires that disposal of such a surface tract would not unnecessarily interfere with development of the underlying federal mineral resource.

Jurisdictional transfers of federal lands to or from other federal departments or agencies may occur when:

(1) The transfer would result in increased management efficiency and is no longer needed by that department or agency;

(2) The transfer would result in decreased administrative costs to the federal government; and

(3) The transfer would serve the public or national interest.

Conveyances under the R&PP Act would be made to qualified applicants (state, county, local governments and nonprofit organizations) on a case-by-case basis only after careful examination to assure that they would be in the public or national interest. These conveyances usually result in a more beneficial public use such as wildlife reserves, schools and colleges, parks, recreation sites, cemeteries, museums, fairgrounds.

The mineral estate would be reserved to the United States in most land disposals, except as provided under Sections 206 and 209 of FLPMA. These sections state that mineral exchanges and sales could be considered on an individual basis when in the public interest or when the mineral values are shown to be absent or insignificant. Mineral exchanges would be considered either separately or in conjunction with the surface estate.

Land actions would be used to improve the land ownership pattern and provide increased public benefits.

Other Resource Programs

Cultural Resources

Cultural resources are historic and prehistoric properties (sites) which evidence human use or occupation such as homestead remains and ancient Indian camps. Many of these sites are important to our heritage and are capable of providing important information about the past. They are among those resources recognized and managed under BLM's philosophy of multiple use of the public lands.

The Bureau endeavors to manage cultural resources in a stewardship role for public benefit. This objective is accomplished, in part, through a use-evaluation system designed: (1) to analyze the scientific and sociocultural values of cultural resources; (2) to provide a basis for utilization of cultural resources; (3) to make cultural resources an important part of the planning system; and (4) to identify information needed when existing documentation of actual or potential use of individual sites or properties. The uses are as follows:

1. Sociocultural Use. This category refers to the use of an object (including flora and fauna), structure, or place based on a social or cultural group's perception that the item has utility in maintaining the group's heritage or existence.

2. Current Scientific Use. This category refers to a study or project in progress at the time of evaluation for which scientists or historians are using a cultural resource as a source of information that will contribute to the understanding of human behavior.

3. Management Use. This category refers to the use of a cultural resource by the BLM or other entities interested in the management of cultural resources, to obtain specific information that is needed for the reasonable utilization of such properties or for the development of effective preservation measures.

4. Conservation for Future Use. This category refers to the management of cultural resources by segregating them from other forms of appropriation until specific conditions are met in the future. Such conditions may include the development of research techniques that are presently not available or the exhaustion of all other resources similar to those represented in the protected sample. The category is intended to provide long-term, onsite preservation and protection of select cultural resources.

5. Potential Scientific Use. This category refers to the potential use (utilizing research techniques currently available) of a cultural resource as a source of information that will contribute to the understanding of human behavior.

These uses of public cultural resources by qualified institutions are authorized and monitored by BLM through a permit system. BLM will continue to investigate and prosecute unauthorized use or destruction of significant cultural properties.

Cultural resource management objectives are also accomplished, in part, through development of site or area specific activity plans which identify cultural resource use and protection objectives, establish actions which must be taken to achieve the objectives, and outline procedures for evaluating accomplishments.

Cultural resources will continue to be inventoried and evaluated to adequately consider the effects of proposed BLM actions on cultural properties which may be eligible for the National register of Historic Places. This inventory and evaluation is routinely a part of project level planning and includes consultation with the State Historic Preservation Office and Advisory Council on Historic Preservation per current regulations, policy, and memoranda of agreement. Cultural resources will be evaluated against the National Register criteria.

As time and funds permit, the BLM will continue to conduct inventories under the Cultural Resource Program to find and document cultural properties which qualify for the National Register. These later surveys will be directed toward areas where prior data indicate a possible need for active resource management to protect important sites. The BLM may also acquire scientifically or historically valuable sites through land exchanges, when such a goal is determined to be in the public interest.

Forestry

Forestry products such as firewood, posts, poles and timber are sold on an incidental basis. The forestry resource will continue to be managed at the present level.

Paleontological Resources

Paleontological resources currently are protected by clearance or review action on a case-by-case basis. Avoidance or mitigation of specimens is occasionally called for when there are surface disturbances. Management plans will be developed for significant properties requiring protection or stabilization. Monitoring and recording of specimen locations will continue.

Recreation

The Resource Area has much outdoor recreation potential and moderate demand for developed recreation sites. Management direction will continue to protect the potential recreation values. Recreation facilities consist of six fishing ponds, two creeks stocked with fish and two recreation areas that provide camping, picknicking, fishing and sightseeing. Recreation facilities will continue to be maintained at a modest level. Access to more public land for future recreation potential is one of the long range lands goals.

The entire Resource Area is designated as open to off-road vehicle (ORV) use, except for all areas in the Fort Meade Planning Unit. The Planning Unit was previously designated closed except for designated roads and trails. Restrictions or closures to ORV use may be established if future problems are identified. Due to extremely dry or wet conditions, the Area Manager may prohibit vehicular traffic on public land trails for short periods.

Visual resources will continue to be evaluated as a part of activity and project planning. This evaluation considers the significance of a proposed project and the visual sensitivity of the affected area. Stipulations are attached as appropriate to assure compatibility of projects with protection or enhancement of the visual resources.

Areas of Critical Environmental Concern (ACEC)

There are no ACECs identified in the Resource Area. If such areas are identified in the future and their resource values cannot be protected through other management techniques, ACEC designation may be made.

Minerals

National policy is that private industry is encouraged to explore and develop federal minerals to satisfy national and local need. This policy provides for economically and environmentally sound exploration, extraction and reclamation practices.

Public lands are open and available for mineral exploration and development unless withdrawn or administratively restricted. Mineral development may occur along with other resource uses. Programs to obtain and evaluate current energy and mineral data are encouraged.

BLM mineral management is categorized into leasable, locatable, and saleable minerals. (See Chapter 3, Minerals.) The leasable minerals, including coal and oil and gas, are administered under the Minerals Leasing Act of 1920. Rights to leasable minerals are acquired either by lease on application by prospecting permit or by competitive lease, except for coal which is leased competitively and licensed (Appendix L). Locatable mineral exploration and development on the Resource Area will continue to be administered through existing surface and mineral management regulations (43 CFR 3809 and 3800). The Resource Area will meet the demand for saleable resources through sales or free use permits on a case-by-case basis, as in the past.

Oil and Gas Exploration and Development

The 1980 Programmatic Environmental Assessment (EA) of the BLM oil and gas leasing program in the Miles City District is the policy document for oil and gas activity management in the Resource Area. Alternatives, the proposed action and no leasing, were considered in the EA. See Appendix E for a summary of impacts. Exploration and development on public lands will continue to be managed in accordance with this document. The BLM supervises oil and gas activities on federal minerals from lease issuance and seismic exploration through actual operations and abandonment. BLM also inspects oil and gas lease operations and evaluates geological, engineering, and economic aspects of drilling and production activity to ensure resource protection and proper collection of revenues. (See Appendix D.)

RATIONALE FOR SELECTING THE PREFERRED ALTERNATIVE

Each of the four alternatives considered in detail in the next section represents a comprehensive plan for managing all land and resources based on the management themes of: Alternative A, no action which is continuation of present management; Alternative B, extensive management of all resources; Alternative C; intensive management of resources with an emphasis on the range resource; and Alternative D, resource protection. The alternatives are summarized on Table 2-2. Following an environmental analysis of each alternative and considering planning questions and planning criteria about the alternatives, a single management alternative then could not be selected from any one of the four to most effectively resolve all the issues. However, a mixture of issue treatments from three of the alternatives arose as the preferred management approach to resolving these concerns.

The Preferred Alternative was structured to include certain aspects of vegetation apportionment from Alternatives A, C and D, and lands from Alternative B and C.

Vegetation Apportionment

The vegetation apportionment proposal selected as the preferred alternative included grazing management actions from three alternatives, Alternative A, Alternative C and Alternative D. These alternatives would apply to specific allotments for grazing management intensity and would provide for a balanced improvement of vegetation, wildlife habitat, and watershed conditions.

Alternative A would apply to 16 allotments, Alternative C would apply to 45 allotments, and Alternative D would apply to seven allotments. The reasons for selecting allotment management under each alternative is as follows: Alternative A—allotment rangelands are in good to excellent condition and the present management level is proper; Alternative C—allotments are in need of monitoring, evaluation and possibly intense management to resolve resource problems and to increase production. The production which could be apportioned to livestock, according to current conditions and range site guides, is exceeded by the grazing preference on 31 of the 45 allotments (68%). Sixteen of those 31 allotments (52%) have fair condition ranges; and Alternative D—allotments have riparian areas which have potential for improvement. This alternative most effectively resolves the planning questions of vegetation apportionment among livestock, watershed and wildlife and the effect of this apportionment on multiple-use resource management; and allotment categorization. It also makes full use of all planning criteria concerning this issue.

Lands

The lands portion from Alternatives B and C were selected for preferred because they best address the planning questions of repositioning the public lands, increasing management efficiency, increasing public access and enhancing the ability to acquire lands with high public values. Under this theme, improved land ownership patterns would be achieved using exchange as the preferred method of land transaction, but also would allow sales as a method of disposal. Exchanges are preferred by the BLM and the public. Public land would largely remain under federal ownership. Transactions would only be made after careful consideration of all criteria and would cause the fewest adverse impacts and the most beneficial impacts.

PREFERRED ALTERNATIVE

This alternative is a mix of the other alternatives. It provides for resource management which best resolves the planning questions and criteria and includes full consideration of multiple-use and environmental consequences.

Vegetation Apportionment

In the short term (5 years), vegetation apportionment for livestock would be 45,305 AUMs with watershed and wildlife forage and cover receiving 116,103 AUMs for a total of 161,408 AUMs. In the long term (over 15 years), vegetation apportionment for livestock would be 50,367 AUMs (a 5,062 AUM increase) with watershed and wildlife forage and cover receiving 127,808 AUMs (a 11,705 AUM increase) for a total of 178,175 AUMs. Livestock use by individual allotment is shown in Appendix B.

Adjustments in the livestock apportionment could be made if monitoring showed a significant change in the allotment grazing capacity as a result of management actions applied in this alternative. Vegetation use adjustments would be based on site specific monitoring studies, which determine proper use as reflected by trend in plant species composition and soil erosion condition. Adjustments would be made after a period of monitoring (not to exceed 5 years) to acquire data adequate to support an adjustment and after coordination and consultation with the operator.

This alternative would result in 31,783 acres of public range improving from fair to good or better condition as a result of changes in grazing management, range improvements, mechanical treatment and tame pasture development. Approximately 1,663 acres of the fair condition range could be mechanically treated if it did not respond to changes in grazing management. Mechanical treatments could include scalping, chiseling, contour furrowing, ripping, interseeding and chaining. Other treatments could include herbicides and prescribed fire. A total of 7,372 acres, regardless of condition, has the potential to be converted to tame pasture. The

TABLE 2-2
SUMMARY OF ALTERNATIVES

<table>
<tr><th>Issue</th><th colspan="3">Preferred Alternative</th><th colspan="3">Alternative A</th></tr>
<tr><td rowspan="6">Vegetation Apportionment</td><td colspan="3">Vegetation apportionment would be:</td><td colspan="3">Vegetation apportionment on M and I allotments:</td></tr>
<tr><td></td><td>Short Term (AUMs)</td><td>Long Term (AUMs)</td><td></td><td>Short Term (AUMs)</td><td>Long Term (AUMs)</td></tr>
<tr><td>Livestock</td><td>45,305</td><td>50,367</td><td>Livestock</td><td>45,305</td><td>45,305</td></tr>
<tr><td>Rangeland Watershed and wildlife forage and cover</td><td>116,103</td><td>127,808</td><td>Rangeland Watershed and wildlife forage and cover</td><td>116,103</td><td>128,287</td></tr>
<tr><td>TOTAL</td><td>161,408</td><td>178,175</td><td>TOTAL</td><td>161,408</td><td>173,592</td></tr>
<tr><td colspan="3">Management actions for the 68 M and I allotments have been selected from Alternative A for 16 allotments, from Alternative C for 45 allotments and from Alternative D for seven allotments. Fair condition ranges would be improved to good or better on 31,783 acres. About 1,663 acres of the fair condition range could be mechanically treated if they did not respond to grazing management. Tame pasture development could occur on 7,372 acres regardless of present condition (513 acres are in fair condition). Vegetation and and erosion conditions would improve on 6,082 acres of fragile soils because grazing would be deferred until after the wet spring season. Livestock would be excluded from 1,331 acres of riparian areas on seven allotments and vegetation conditions would approach climax in those areas and then level off and stagnate. Fencing and water developments would be required, in addition to the normal two miles of fence and eight water sources, to protect riparian areas. Prairie dog management and noxious weed control would occur as necessary; acres of occurrence on public lands are unknown.</td><td colspan="3">There would be a total of 31,783 acres of fair condition range improved to good or better condition on M and I allotments through grazing management. Increase in vegetation would be apportioned to uses other than livestock. Two miles of fence and eight water sources would be replaced or maintained annually. Priaire dog management and noxious weed control would occur as necessary; acres of occurrence on public lands are unknown.</td></tr>
<tr><td>Lands</td><td colspan="3">Over the long term (15 year), a total of 85,000 acres would be categorized for disposal. Jurisdictional transfers with other federal agencies and exchanges with the State of South Dakota would be considered on a case-by-case basis on up to 65,000 acres. On an annual basis, approximately 300 acres would be considered for sale and 1,000 acres would be considered for other exchanges. Disposals under the Recreation Public Purposes Act would continue on a case-by-case basis.</td><td colspan="3">Adjustments to the land pattern would be made on a case-by-case basis. Over the long term, there would be an estimated 3,000 acres sold and 15,000 acres exchanged. Disposal under the Recreation and Public Purpose Act would continue on a case-by-case basis.</td></tr>
</table>

TABLE 2-2 (continued)
SUMMARY OF ALTERNATIVES

Alternative B	Alternative C	Alternative D
Vegetation apportionment on M and I allotments:	Vegetation apportionment on M and I allotments:	Vegetation apportionment on M and I allotments:

	Alternative B		Alternative C		Alternative D	
	Short Term (AUMs)	Long Term (AUMs)	Short Term (AUMs)	Long Term (AUMs)	Short Term (AUMs)	Long Term (AUMs)
Livestock	45,305	42,934	45,305	57,512	45,305	53,493
Rangeland Watershed and wildlife forage and cover	116,103	128,802	116,103	130,257	116,103	137,460
TOTAL	161,408	171,736	161,408	187,769	161,408	190,953

Alternative B	Alternative C	Alternative D
There would be a total of 31,783 acres of fair condition range improved to good or better condition through grazing management and mechanical treatment. Two miles of fence and eight water sources would be constructed annually and those water sources having wildlife values would be fenced. About 1,666 acres of the fair condition range could be mechanically treated over the long term. Prairie dog management and noxious weed control would occur as necessary; acres of occurrence on public lands are unknown.	There would be a total of 31,783 acres of fair condition range improved to good or better condition through grazing management, mechanical treatment and tame pasture development. Two miles of fence and eight water sources would be constructed annually and those water sources having wildlife values would be fenced. About 1,666 acres of the fair condition range could be mechanically treated and 8,115 acres could be converted to tame pasture regardless of present condition (1,995 acres are in fair condition) over the long term. Prairie dog management and noxious weed control would occur as necessary; acres of occurrence on public lands are unknown.	A total of 31,783 acres of fair range would be improved to good or better condition. Livestock would be excluded from 1,560 acres of riparian areas and vegetation would approach climax in those areas and then level off and stagnate. Vegetation and erosion conditions would improve on 29,306 acres of fragile soils because grazing would be deferred until after the wet spring season. Fencing and water development would be required, in addition to the normal two miles of fence and eight water sources, to protect riparian and fragile soil areas. About 1,663 acres of the fair condition range could be mechanically treated and 6,725 acres of tame pasture could be developed (1,466 acres are in fair condition). Prairie dog management and noxious weed control would occur as necessary; acres of occurrence on public lands are unknown.
Over the long term (15 years), a total of 85,000 acres would be categorized for disposal. Jurisdictional transfers with other federal agencies and exchanges with the State of South Dakota would be considered on a case-by-case basis on up to 65,000 acres. On an annual basis, approximately 300 acres would be considered for sale and 1,000 acres would be considered for exchanges. Disposal under the Recreation and Public Purposes Act would continue on a case-by-case basis.	Over the long term (15 years), a total of 85,000 acres would be categorized for disposal. Jurisdictional transfers with the State of South Dakota would be considered on a case-by-case basis on up to 65,000 acres over the long term. On an annual basis, approximately 300 acres would be considered for sale and 1,000 acres would be considered for other exchanges. Disposal under the Recreation and Public Purposes Act would continue on a case-by-case basis.	Lands would be retained under existing ownership patterns. No sales or exchanges would take place. Recreation and Public Purposes Act requests would be addressed on a case-by-case basis.

increase due to range condition improvement and mechanical treatment would be apportioned to livestock (25%) and to watershed and wildlife forage and cover (75%). Vegetation on lands converted to tame pasture would be apportioned primarily to livestock with the other resources receiving only incidental use.

An adjustment of livestock use would be made on fragile soils (6,082 acres) during the wet season of the year and manageable riparian areas (1,331 acres) would be excluded from livestock use on seven allotments.

The "I" category allotments would be upgraded to good or better condition. The "M" allotments would either be maintained in good condition or upgraded, and the "C" allotments would continue under custodial management.

Range improvements over a 15-year period would include about 15 management fences, each averaging 2 miles in length, needed to implement grazing systems. There would also be 120 water sources developed. Construction of approximately a quarter mile of fence and installation of a stock tank would be required for each reservoir fenced because of wildlife values. The primary beneficiary would be responsible for all maintenance.

Estimated cost of range improvements would be $721,560 over the 15-year period, based on the current average cost per improvement. (See Appendix C.) This is a maximum amount as it assumes that all treatments would be required in every case. Actual costs would be lower because less costly methods would be applied first and would solve the resource problem in most cases.

The four existing Allotment Management Plans (AMPs), including 33,565 acres of public land, would continue. Grazing systems which could be used include rest and deferred rotation, deferred or seasonal use, or other methods. Custodial allotments would generally have season and number leases.

The range condition (based on vegetation and soils) of the public land in each allotment has been analyzed in relation to the production potential of range sites, using the SCS Technical Guides as the criteria. Vegetation use has been estimated on the basis of proper use. Management proposals are based on the adequacy of present management and the need for change to improve range condition and develop site potential.

Range condition information is found in Table 2-1 and the allotment categorization methods are the same as described in the Management Guidance Common to All Alternatives under Categorization.

The management of wildlife habitat would include monitoring the condition of areas known to be of high value to wildlife and protecting valuable wildlife habitat in the development and implementation of activity plans.

Manageable riparian areas (1,331 acres) would be fenced to exclude livestock, and livestock waters would be moved outside of these areas. As funding permits, new livestock waters would be constructed in such a manner as to support a viable fish population where possible. Islands would be constructed where possible, and selected new water sources would be partially or completely fenced to exclude livestock.

Lands

Over the long term a total of 85,000 acres of public land would be categorized as having potential for disposal. Jurisdictional transfers with the Forest Service and USDI agencies, and exchanges with the State of South Dakota would be considered on a case-by-case basis on up to 65,000 acres over the long term. On an annual basis, approximately 300 acres would be considered for sale and 1,000 acres would be considered for other exchanges. Disposals under the Recreation and Public Purposes Act would continue on a case-by-case basis. All land actions would be in accordance with federal and state laws and regulations. Bureau and Departmental policy would be followed in all land transactions.

ALTERNATIVE A

This alternative is a continuation of the present management.

Vegetation Apportionment

Present vegetation apportionment of 45,305 Animal Unit Months (AUMs) would be maintained in both the short (5 years) and long term (over 15 years) for livestock. Vegetation apportionment for watershed and wildlife forage and cover would be 116,103 AUMs in the short term and 127,808 AUMs in the long term. Livestock use by individual allotment is shown in Appendix B.

Estimated cost of maintenance or replacement of 30 miles of fence and 120 water sources would be $504,000 over the 15-year period, based on the current average cost per improvement. (See appendix C.) This is a maximum amount. Actual costs would be lower because less costly methods would be applied first and would solve the resource problem in most cases.

Vegetation use adjustments would be based on site specific monitoring studies which determine proper use as reflected by trend in plant species composition and soil erosion.

This alternative would result in 31,183 acres of public range improving from fair to good or better condition as a result of grazing management and/or range improvements.

Four BLM administered AMPs, including 33,565 acres of public land, would continue. (See Chapter 3, Range.)

Current grazing systems would be continued. These systems include rest and deferred rotation, deferred or seasonal use, or other methods. Season and number allotments generally have deferred or seasonal use systems. Custodial allotments generally have seasonal use coordinated with the use of private lands.

The range condition (based on vegetation and soils) of the public land in each allotment has been analyzed in relation to the production potential of range sites, using the SCS Technical Guides as the criteria. Vegetation use has been estimated on the basis of proper use. Management proposals are based on the adequacy of present management and the need for change to improve range condition and develop site potential.

The management of wildlife habitat would continue at the current level. This consists of monitoring the condition of areas known to be of high value to wildlife and protecting valuable wildlife habitat in the development and implementation of activity plans. As funding permits, a certain amount of on-the-ground project development would continue, e.g., installation of bird nesting boxes, bird ramps.

Lands

Over the long term, a total of 18,000 acres of public land would be categorized as having potential for disposal through sale or exchange. On an annual basis, approximately 200 acres would be considered for sale and 1,000 acres would be considered for exchange. Disposals under the Recreation and Public Purposes Act would continue on a case-by-case basis. All land actions would be in accordance with federal and state laws and regulations. Bureau and departmental policy would be followed in all land transactions.

ALTERNATIVE B

This alternative emphasizes the extensive (lower level) management of resources with consideration for all multiple-use values.

Vegetation Apportionment

In the short term (5 years,) on M and I allotments, vegetation apportionment for livestock would be 45,305 AUMs with watershed and wildlife forage and cover receiving 116,103 AUMs for a total of 161,408 AUMs. In the long term (over 15 years), vegetation apportionment for livestock would be 42,934 AUMs (a 2,371 AUM decrease) with watershed and wildlife forage and cover receiving 128,802 AUMs (a 12,699 AUM increase) for a total of 171,736 AUMs. Livestock use by individual allotment is shown in Appendix B.

Adjustments in the livestock apportionment could be made if monitoring showed a significant change in the allotment grazing capacity as a result of management actions applied in this alternative. Vegetation use adjustments would be based on site specific monitoring studies, which determine proper use as reflected by trend in plant species composition and soil erosion condition. Adjustments would be made after a period of monitoring (not to exceed 5 years) to acquire data adequate to support an adjustment and after coordination and consultation with the operator.

This alternative would result in 31,783 acres of public range improving from fair to good or better condition as a result of changes in grazing management, range improvements and mechanical treatment. Approximately 1,666 acres of the fair condition range could be mechanically treated, if it did not respond to changes in grazing management. Mechanical treatments could include scalping, chiseling, contour furrowing, pitting, ripping, interseeding and chaining. Other treatment could include herbicides and prescribed fire.

"I" category allotments would be upgraded to good or better condition. "M" allotments would either be maintained in good condition or upgraded. "C" allotments would continue under custodial management.

Range improvements over a 15-year period would include about 15 management fences, each averaging 2 miles in length, needed to implement grazing systems. There would also be 120 water sources developed. Construction of approximately a quarter mile of fence and installation of a stock tank would be required for each reservoir fenced because of wildlife values. The primary beneficiary would be responsible for all maintenance.

Estimated cost of range improvements would be $537,320, over the 15-year period, based on the current average cost per improvement. (See Appendix C.) This is a maximum amount as it assumes that all treatments would be required in every case. Actual costs would be lower because less costly methods would be applied first and would solve the resource problem in most cases.

The four existing AMPs, including 33,565 acres of public land, would continue. Grazing systems which could be used include rest and deferred rotation, deferred or seasonal use, or other methods. Custodial allotments would generally have season and numbers leases.

The range condition (based on vegetation and soil) of the public land in each allotment has been analyzed in relation to the production potential of range sites, using the SCS Technical Guides as the criteria. Vegetation use has been estimated on the basis of proper use. Management proposals are based on the adequacy of present management and the need for change to improve range condition and develop site potential.

Range condition information is found in Table 2-1 and the allotment categorization method is the same as described in the Management Guidance Common to All Alternatives under Categorization.

The management of wildlife habitat would include monitoring the condition of areas known to be of high value to wildlife and protecting valuable wildlife habitat in the development and implementation of activity plans. As funding permits, new livestock waters would be constructed in such a manner as to support a viable fish population where possible. Islands would be constructed where possible, and selected new water sources would be partially or completely fenced to exclude livestock.

Lands

Over the long term, a total of 85,000 acres of public land would be categorized as having potential for disposal through sale or exchange. Jurisdictional transfers with the Forest Service and USDI agencies, and exchanges with the State of South Dakota would be considered on a case-by-case basis on up to 65,000 acres over the long term. On an annual basis, approximately 300 acres would be considered for sale and 1,000 acres would be considered for other exchanges. Disposals under the Recreation and Public Purposes Act would continue on a case-by-case basis. All land actions would be in accordance with federal and state laws and regulations. Bureau and departmental policy would be followed in all land transactions.

ALTERNATIVE C

This alternative is intensive management with an emphasis on the range resource.

Vegetation Apportionment

In the short term (5 years), on M and I allotments, vegetation apportionment to livestock would be 45,305 AUMs with watershed and wildlife forage and cover receiving 116,103 AUMs for a total of 161,408 AUMs. In the long term (over 15 years), vegetation apportionment for livestock would be 57,512 AUMs (a 12,207 AUM increase) with watershed andwildlife forage and cover receiving 130,257 AUMs (a 14,154 AUM increase) for a total of 187,769 AUMs. Livestock use by individual allotment is shown in Appendix B.

Adjustments in the livestock apportionment could be made if monitoring showed a significant change in the allotment grazing capacity as a result of management actions applied in this alternative. Vegetation use adjustments would be based on site specific monitoring studies, which determine proper use as reflected by trend in plant species composition and soil erosion condition. Adjustments would be made after a period of monitoring (not to exceed 5 years) to acquire data to support an adjustment and after consultation and coordination with the operator.

This alternative would result in 31,783 acres of public range improving from fair to good or better condition as a result of changes in grazing management, range improvements, mechanical treatment and tame pasture development.

Approximately 1,666 acres of the fair condition range could be mechanically treated if it did not respond to changes in grazing management. Mechanical treatments could include scalping, chiseling, contour furrowing, pitting, ripping, interseeding and chaining. Other treatments could include herbicides and prescribed fire. A total of 8,115 acres, regardless of condition, have the potential to be converted to tame pasture. The increase due to range condition improvement and mechanical treatment would be apportioned to livestock (25%) and to watershed and wildlife forage and cover (75%). Vegetation on lands converted to tame pasture would be apportioned primarily to livestock with the other resources receiving only incidental use.

"I" category allotments would be upgraded to good or better condition. "M" allotments would either be maintained in good condition or upgraded. "C" allotments would continue under custodial management.

Range improvements over a 15-year period would include about 15 management fences, each averaging 2 miles in length, needed to implement grazing systems. There would also be 120 water sources developed. Construction of approximately a quarter mile of fence and installation of a stock tank would be required for each reservoir fenced because of wildlife values. The primary beneficiary would be responsible for all maintenance.

Estimated cost of range improvements would be $740,195 over the 15-year period, based on the current average cost per improvement. (See Appendix C.) This is a maximum amount as it assumes that all treatments would be required in every case. Actual costs would be lower because less costly methods would be applied first and would solve the resource problem in most cases.

The four existing AMPs, including 33,565 acres of public land, would continue. Grazing systems which could be used include rest and deferred rotation, deferred or seasonal use, or other methods. Custodial allotments would generally have season and number leases.

The range condition (based on vegetation and soils) of the public land in each allotment has been analyzed in relation to the production potential of range sites, using the SCS Technical Guides as the criteria. Vegetation use has been estimated on the basis of proper use. Management proposals are based on the adequacy of present management and the need for change to improve range condition and develop site potential.

Range condition information is found in Table 2-1 and the allotment categorization methods are the same as described in the Management Guidance Common to All Alternatives Under Categorization.

The management of wildlife habitat would include monitoring the condition of areas known to be of high value to wildlife and protecting valuable wildlife habitat in the development and implementation of activity plans. As funding permits, new livestock waters would be constructed in such a manner as to support a viable fish population where possible. Islands would be constructed where possible and selected new water sources would be partially or completely fenced to exclude livestock.

Lands

Over the long term, a total of 85,000 acres of public land would be categorized as having potential for disposal through sale or exchange. Jurisdictional transfers with the Forest Service and USDI agencies, and exchanges with the State of South Dakota would be considered on a case-by-case basis on up to 65,000 acres over the long term. On an annual basis, approximately 300 acres would be considered for sale and 1,000 acres would be considered for other exchanges. Disposal under the Recreation and Public Purposes Act would continue on a case-by-case basis. All land actions would be in accordance with federal and state laws and regulations. Bureau and Departmental policy would be followed in all land transactions.

Alternative D

This alternative emphasizes intensive management while protecting riparian areas and fragile soils.

Vegetation Apportionment

Emphasis would be placed on watershed and wildlife values. In the short term (5 years) on M and I allotments, vegetation apportionment to livestock would be 45,305 AUMs with rangeland and watershed maintenance, wildlife forage and cover receiving 116,103 AUMs for a total of 161,408 AUMs. In the long term (over 15 years), vegetation apportionment for livestock would be 53,493 AUMs (a 8,188 AUM increase) with watershed and wildlife forage and cover receiving 137,460 AUMs (a 21,357 AUM increase) for a total of 190,953 AUMs. Livestock use by individual allotment is shown in Appendix B.

A deferment of livestock use would be made on fragile soils (30,436 acres) during the wet season of the year and riparian areas (1,560 acres) would be excluded from livestock use.

Adjustments in the livestock apportionment would be made if monitoring showed a significant change in the allotment grazing capacity as a result of management actions applied in this alternative. Vegetation use adjustments would be based on site specific monitoring studies which determine proper use as reflected by trend in plant species composition and soil erosion condition. Adjustments would be made after a period of monitoring (not to exceed 5 years) to acquire data to support an adjustment and after consultation and coordination with the operator.

This alternative would result in 31,783 acres of public range improving from fair to good or better condition as a result of changes in grazing management, range improvements, mechanical treatment and tame pasture development. Approximately 1,663 acres of fair condition range could be mechanically treated if they did not respond to changes in grazing management. Mechanical treatments could include scalping, chiseling, contour furrowing, pitting, ripping, interseeding and chaining. Other treatment could include herbicides and prescribed fire. A total of 6,725 acres, regardless of condition, has the potential to be converted to tame pasture.

"I" category allotments would be upgraded to good or better condition. The "M" allotments would either be maintained in good condition or upgraded, and the "C" allotments would continue under custodial management.

Range improvements over a 15-year period would include about 15 management fences, each averaging 2 miles in length, needed to implement grazing systems. There would also be 120 water sources developed. Construction of approximately a quarter mile of fence and installation of a stock tank would be required for each reservoir fenced because of wildlife values. Water sources that are presently in a riparian area would have to be replaced. The primary beneficiary would be responsible for all maintenance.

Estimated cost of range improvements would be $705,385 over the 15-year period, based on the current average cost per improvement. (See Appendix C.) This is a maximum amount as it assumes that all treatments would be required in every case. Actual costs would be lower because less costly methods would be applied first and would solve the resource problem in most cases.

The range condition (based on vegetation and soils) of the public land in each allotment has been analyzed in relation to the production potential of range sites, using the SCS Technical Guides as the criteria. Vegetation use has been estimated on the basis of proper use. Management proposals are based on the adequacy of present management and the need for change to improve range condition and develop site potential.

Range condition information is found in Table 2-1 and the allotment categorization method is the same as described in the Management Guidance Common to All Alternatives for Categorization.

The four existing AMPs, including 33,565 acres of public land,would continue. Grazing systems which could be used include rest and deferred rotation, deferred or seasonal use, or other methods. Custodial allotments would generally have season and number leases.

The management of wildlife habitat would include monitoring the condition of areas known to be of high value to wildlife and protecting valuable wildlife habitat in the development and implementation of activity plans. Riparian areas (1,560 acres) would be fenced to exclude livestock, and livestock waters would be moved outside of these areas. As funding permits, new livestock waters would be constructed in such a manner as to support a viable fish population where possible. Islands would be constructed where possible and selected new water sources would be partially or completely fenced to exclude livestock.

Lands

The public lands would be retained under existing ownership patterns except for Recreation and Public Purposes (R&PP) actions. No sales or exchange actions would take place. No Bureau-initiated R&PP proposals would be considered, but R&PP applications would be considered from qualified applicants.

SUMMARY OF THE CUMULATIVE IMPACTS

Table 2-3, Summary of the Cumulative Impacts, is an abbreviated display of impacts addressing each alternative, as required by regulation. The full description of impacts by alternative, is contained in Chapter 4.

TABLE 2-3
SUMMARY OF THE CUMULATIVE IMPACTS

Affected Resource	Preferred Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Cultural	The impacts on the cultural resource would be insignificant.	The impacts on the cultural resource would be insignificant.	The impacts on the cultural resource would be insignificant.	The impacts on the cultural resource would be insignificant.	The impacts on the cultural resource would be insignificant.
Forestry	The impacts on the forest resource would be insignificant.	The impacts on the forest resource would be insignificant.	The impacts on the forest resource would be insignificant.	The impacts on the forest resource would be insignificant.	There would be no impacts on the forest resource.
Paleontologic	The impacts on the paleontologic resource would be insignificant.	The impacts on the paleontologic resource would be insignificant.	The impacts on the paleontologic resource would be insignificant.	The impacts on the paleontologic resource would be insignificant.	The impacts on the paleontologic resource would be insignificant.
Recreation	Moderately beneficial impacts on the recreation resource would be significant.	Moderately beneficial impacts on the recreation resource would be significant.	Moderately beneficial impacts on the recreation resource would be significant.	Moderately beneficial impacts on the recreation resource would be significant.	The impacts on the recreation resource would be insignificant.
Minerals	The impacts on the minerals resource would be insignificant.	The impacts on the minerals resource would be insignificant.	The impacts on the minerals resource would be insignificant.	The impacts on the minerals resource would be insignificant.	There would be no impacts on the minerals resource.
Soils	There would be insignificant windborne soil loss of 245 acre feet. Moderately beneficial impacts on 7413 acres of fragile soils and riparian areas would be significant. Other impacts on the soil resource would be insignificant.	There would be insignificant windborne soil loss of 9 acre feet. Other impacts on the soil resource would be insignificant.	There would be insignificant windborne soil loss of 59 acre feet. Other impacts on the soil resource would be insignificant.	There would be insignificant windborne soil loss of 261 acre feet. Other impacts on the soil resource would be insignificant.	There would be insignificant windborne soil loss of 227 acre feet. Moderately beneficial impacts on 30,866 acres of fragile soils and riparian areas would be significant. Other impacts on the soil resource would be insignificant.
Hydrology	Minor beneficial impacts on sediment loads from 413 acres of fragile soils and riparian areas would be significant. Other impacts would be insignificant.	The impacts on the hydrology resource would be insignificant.	The impacts on the hydrology resource would be insignificant.	The impacts on the hydrology resource would be insignificant.	Minor beneficial impacts on sediment loads from 30,866 acres of fragile soils and riparian areas would be significant. Other impacts on the soil resource would be insignificant.
Range	Moderate beneficial impacts on the trend and condition of the range resource would be significant. Increase of 5062 livestock AUMs would be significant.	Minor beneficial impacts on the trend and condition of the range resource would be significant. There would be no impact on the livestock AUMs.	Minor beneficial impacts on the trend and condition of the range resource would be significant. Decrease of 2371 livestock AUMs would be insignificant (less than 10%).	Moderate beneficial impacts on the trend and condition of the range resource would be significant. Increase of 12,207 livestock AUMs would be significant.	Moderate beneficial impacts on the trend and condition of the range resource would be significant. Increases of 8188 livestock AUMs would be significant.
Wildlife	Moderate beneficial impacts on wildlife resource would be significant. Temporary adverse impacts of mechanical treatments are insignificant.	Moderate beneficial impacts on wildlife resource would be significant.	Moderate beneficial impacts on wildlife resource would be significant. Temporary adverse impacts of mechanical treatments are insignificant.	Moderate beneficial impacts on wildlife resource would be significant. Temporary adverse impacts of mechanical treatments are insignificant.	Moderate beneficial impacts on wildlife resource would be significant. Temporary adverse impacts of mechanical treatments are insignificant.
Lands	Moderate beneficial impacts on the lands resource would be significant.	Moderate beneficial impacts on the lands resource would be significant.	Moderate beneficial impacts on the lands resource would be significant.	Moderate beneficial impacts on the lands resource would be significant.	Opportunity forgone would be a moderate negative significant impact on the lands resource.
Economic & Social	Regional impacts are insignificant. Two operations have decreases and 17 have increases in AUMs that are significant. Impacts to local government revenues resulting from BLM/State exchanges are significant. All other impacts are insignificant.	Regional impacts are insignificant. There are no impacts to operations. All other impacts are insignificant.	Regional impacts are insignificant. One operation has a decrease and eight have increases in AUMs that are significant. Impacts to local government revenues resulting from BLM/State exchanges are significant. All other impacts are insignificant.	Regional impacts are insignificant. Twenty-six operations have increases in AUMs that are significant. Impacts to local government revenues resulting from BLM/State exchanges are significant. All other impacts are insignificant.	Regional impacts are insignificant. One operation has a decrease and 21 operations have increases in AUMS that are significant. All other impacts are insignificant.

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter provides a discussion, by resource, of the environment affected by the individual proposals under the various alternatives in this RMP. This information is summarized from the Management Situation Analysis (MSA) on file at the BLM Miles City District and South Dakota Resource Area Office.

Climate

Western South Dakota has a wide variety of climatic conditions characterized by some extreme weather variations. The Black Hills region receives around 18 to 22 inches of precipitation, while the semi-arid plains surrounding them receive around 13 to 17 inches during an average year. The majority of the precipitation, 70 to 80 percent, occurs during the growing season from April to September. In 2 years out of 10, the rainfall during the growing season could be less than 11 inches. The major source of rainfall is thunderstorms, which are occasionally accompanied by hail. The average seasonal snowfall ranges from 155 inches in the Black Hills to 21 inches in the plains.

Mean annual temperature is about 45°F. Temperatures are lowest in January, with an average low of about 0°F, and the highest in July, with an average high of about 86°F. The frost-free season ranges from 114 to 160 days. Relative humidity in the afternoon averages around 50 percent.

Topography

The Resource Area is in the Missouri River Plateau of the Great Plains physiographic province. The west-central part is in the Black Hills division. The northern part of the Resource Area is in the Cretaceous Table Lands division, and the remaining area is part of the Pierre Hills division. Outside the Black Hills uplift area are the nearly flat layers of sedimentary rock cut by streams which form a dissected landscape of plateaus, rough breaks, flat bottomed valleys, and rolling plains. Harder sandstones form benches while the softer shales form gentle slopes or badlands. The Black Hills consist of tree covered mountains that are gently sloping to steep along drainage ways.

The Grand, Moreau, Cheyenne, Bad and White Rivers flow east to the Missouri River. The Belle Fourche River flows into the Cheyenne River in Meade County. The Little Missouri drainage, in the northwestern part of the state, flows north reaching the Missouri River in North Dakota.

Elevations range from 1,200 feet to 7,242 feet above sea level. The highest elevation is Harney Peak in the Black Hills. The lowest elevations are along the Missouri River.

SOILS

Soils in the Resource Area are derived from marine clay shale, sedimentary siltstone, sandstone, limestone and alluvium. Soils vary considerably over short distances in depth, profile development, and physical and chemical properties; these factors influence the soils manageability. These features reflect the differences in annual precipitation (13-17 inches per year), aspect and underlying bedrock. Most of the soils are low in organic matter and fertility and high in clay and sodium content.

Soils of the area (Map 3-1) are mainly located in five Major Land Resource Areas (MLRAs 58, 60, 61, 62, and 63, Map 3-2). MLRAs differ by location, topographic extent, and various soil properties such as soil depth. Following is an overview of the MLRAs and major associated soils in the area.

MLRA 58, Northern Rolling High Plains includes:

A. Deep, moderately well-drained and well-drained, clayey, (Absher, Daglum, Loburn, Rhodes) sodium-affected soils on nearly level to strongly sloping terraces, fans and footslopes. They have slight to moderate erosion hazards. These soils are formed in sodium-affected alluvium from local sources.

B. Shallow and moderately deep, well-drained, loamy (Cabbart, Cabba, Lantry) soils and sandy (Blackhall, Twilight) soils on moderately sloping to steep footslopes, side slopes and ridges. They have moderate to severe erosion hazards. These soils are formed in soft sedimentary siltstones and sandstones.

Soils of this MLRA represent about 10 percent of the planning area.

MLRA 60, The Pierre Shale Plains and Badlands includes:

A. Deep, well-drained clayey (Hisle, Kyle, Lohmiller, Stetter) and sandy (Glenberg) soils on nearly level floodplains and low terraces. They have moderate to high erosion hazards. These soils are formed in alluvium from local clay shale and sandstone sources.

B. Deep, well-drained clayey (Absher, Arvada, Oburn, Swanboy, Twotop,Wasa, Winler) and loamy (Archin) soils on nearly level to gently sloping fans and stream terraces. They have low to moderate erosion hazards. These soils are formed in alluvium from local sources and are strongly affected by sodium.

C. Shallow and moderately deep, well-drained, clayey (Midway, Epsie, Lismas, Pierre, Samsil), and loamy (Cabbart, Redig, Scroggin) soils on moderately sloping to steep dissected shale uplands. These soils have moderate to severe erosion hazards. They are formed in soft sedimentary shale, siltstone and sandstone.

Soils of this MLRA represent about 80 percent of the planning area.

MLRA 61, The Black Hills Footslopes Area includes:

A. Deep, well-drained, clayey (Lohmiller, Stetter), loamy (St. Onge), sandy (Glenberg, Bankard) and gravelly (Winnetti) soils on nearly level floodplains and low terraces. They have slight erosion hazards. These soils are formed in alluvium from local sources.

B. Deep and moderately deep, well-drained clayey (Kyle, Hisle) and loamy (Blackpipe, Manvel, Tilford) soils on gently to strongly sloping fans and footslopes. They have slight to severe erosion hazards. These soils are formed in alluvium from local sources. Hisle soils are strongly affected by sodium.

C. Shallow and moderately deep, well-drained clayey (Canyon, Grummit, Hisle, Lismas, Midway, Pierre, Rekop, Samsil), loamy (Nevee, Spearfish) and gravelly (Nihill, Paunsaugunt), soils on moderately sloping to steep dissected shale and limestone uplands. They have moderate to severe erosion hazards. These soils are formed in clayey shale and local alluvium.

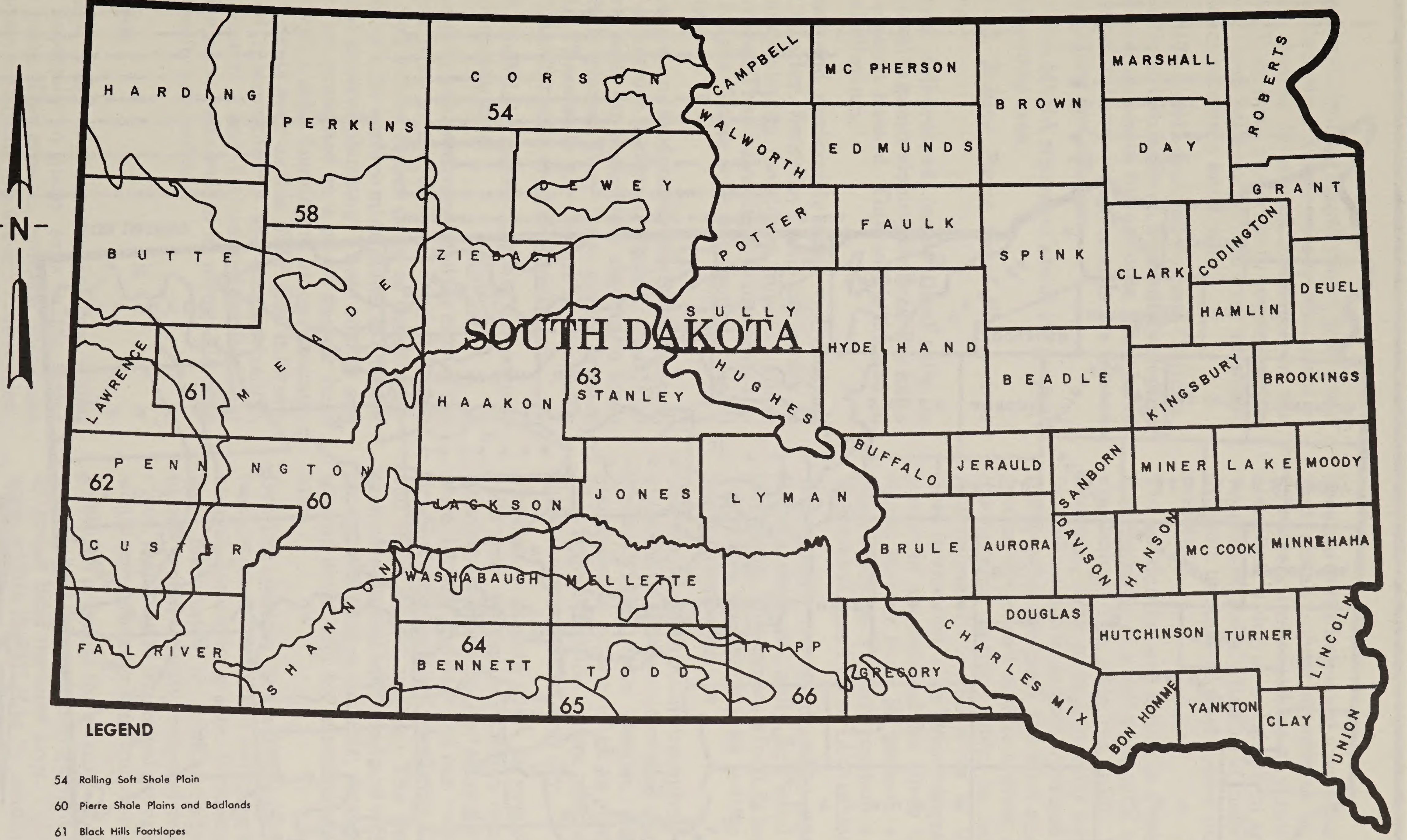
Soils of this MLRA represent about three percent of the planning area.

MLRA 62, The Black Hills

A. Deep, well-drained clayey (Kyle), loamy (Altvan) and gravelly (Winetti, Nihill) soils on nearly level floodplains and low terraces. They have moderate to high erosion hazards. These soils are formed in alluvium from local sources.

Western South Dakota

Major Land Resource Areas



LEGEND

54 Rolling Soft Shale Plain
60 Pierre Shale Plains and Badlands
61 Black Hills Footslopes
62 Black Hills
63 Rolling Pierre Shale Plains
64 Mixed Sandy and Silty Tableland
65 Nebraska Sand Hills
66 Dakota-Nebraska Eroded Tableland

A land resource area is a geographic area of land characterized by a particular combination or pattern of soils (including slope and erosions), climate, water resources, and land use.

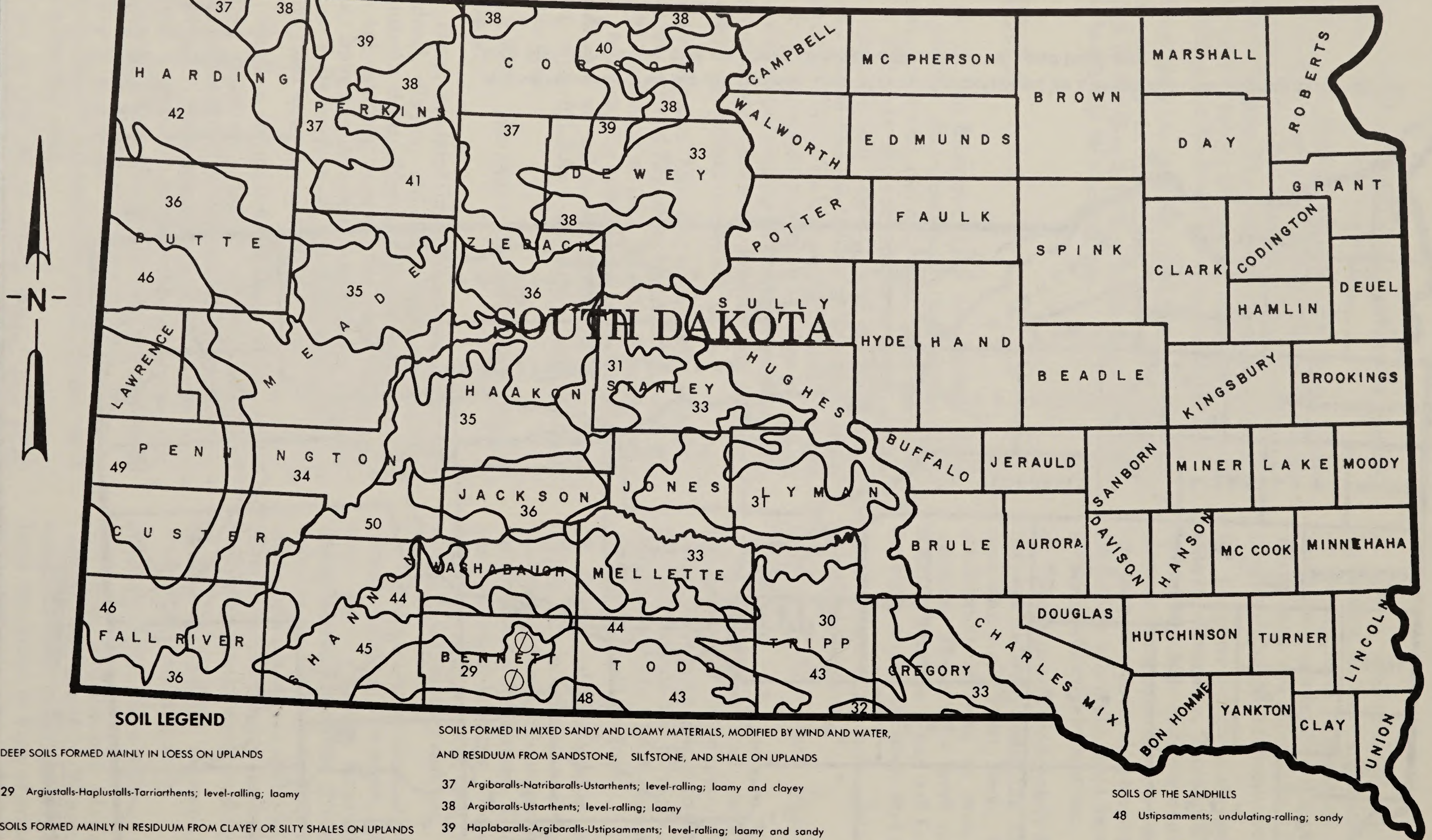
10 0 10 20 30 40 50
MILES SCALE

Revised 7/84 (BLM)

MAP 3-2

Western South Dakota

Soils



MAP 3-1

SOIL LEGEND

DEEP SOILS FORMED MAINLY IN LOESS ON UPLANDS

29 Argiustolls-Haplustolls-Torriorthents; level-rolling; loamy

SOILS FORMED MAINLY IN RESIDUUM FROM CLAYEY OR SILTY SHALES ON UPLANDS

30 Argiustolls-Haplustolls; level-rolling; clayey; vertic
31 Haplustolls; level-rolling; clayey; vertic
32 Haplustolls-Argiustolls; undulating-steep; clayey and loamy
33 Haplustolls-Ustorthents; shallow; undulating-steep; clayey; vertic
34 Argiustolls-Torriorthents-shallow-Camborthids; undulating-hilly; clayey and loamy
35 Camborthids-Argiustolls; undulating-rolling; clayey and loamy; vertic
36 Camborthids-Torriorthents; shallow; undulating-hilly; clayey; vertic

SOILS FORMED IN MIXED SANDY AND LOAMY MATERIALS, MODIFIED BY WIND AND WATER, AND RESIDUUM FROM SANDSTONE, SILTSTONE, AND SHALE ON UPLANDS

37 Argiborolls-Natriborolls-Ustorthents; level-rolling; loamy and clayey
38 Argiborolls-Ustorthents; level-rolling; loamy
39 Haploborolls-Argiborolls-Ustipsamments; level-rolling; loamy and sandy
40 Ustorthents-Argiborolls; undulating-steep; loamy; shallow
41 Natrargids; level; clayey
42 Torriorthents-Camborthids-Natrargids; undulating-hilly; loamy and clayey; shallow
43 Haplustolls-Argiustolls-Ustorthents; shallow; loamy; level-hilly; coarse-loamy, sandy, fine-loamy over sandy or sandy-skeletal
44 Argiustolls-Torriorthents; undulating-hilly; fine-silty
45 Haplustolls-Torriorthents; shallow; undulating-hilly, coarse-loamy, coarse-silty, and sandy
46 Torriorthents; rolling-steep; loamy and clayey, shallow

SOILS OF THE SANDHILLS

48 Ustipsamments; undulating-rolling; sandy

SOILS OF THE BLACK HILLS

50 Eutroborolfs; rolling-steep; loamy

SOILS OF THE BADLANDS

51 Badlands-Torriorthents; undulating-steep; loamy and clayey

∅ Represents about 100 square miles of Natrustolls

10 0 10 20 30 40 50

MILES SCALE

B. Deep, well-drained clayey (Savo, Kyle), and loamy (Blackpipe, Keith) soils on moderate to strongly sloping fans and footslopes in the uplands. They have moderate to severe erosion hazards. These soils are formed over siltstone, local clayey alluvium and loess.

C. Shallow, well-drained loamy (Butche, Canyon, Spearfish) soils on moderately sloping to steep side slopes in the uplands. They have severe erosion hazards. These soils are formed over sandstone and siltstone.

Soils of this MLRA represent about 1½ percent of the planning area.

MLRA 63, Rolling Pierre Shale Plains Area includes:

A. Deep, well-drained, loamy (Ree) soils on nearly level to gently sloping terraces. Ree has a slight erosion hazard. This soil is formed in regional alluvium.

B. Deep and moderately deep, well-drained, clayey (Hurley, Swanboy) soils on gently to moderately sloping footslopes, upland valleys and terraces. They have slight to moderate erosion hazards. These soils are formed in local clay shale.

C. Shallow and moderately deep, well-drained, clayey (Chantier, Lakoma, Okaton, Opal, and Sansarc) soils on moderately sloping to steep clay shale plains. They have severe erosion hazards. These soils are formed in local clay shale. Chantier soils are sodium-affected.

Soils of this MLRA represent about five percent of the planning area.

Soil mapping has been completed for most of the Resource Area at the Order II level (1:24,000 scale). Soil survey orders (level of detail) vary from Order I, for surface mine plans, to Order V for broad general planning. These county soil surveys are presented on a photo mosaic base and provide a solid foundation for environmental documents such as this RMP. Soil information and interpretations are summarized in Appendices H, I and J. Care and professional expertise must be exercised in using this data for a specific site and use.

Erosion

Wind and water erosion is a problem which occurs naturally on many soils in the Great Plains area. The erosion problem increases when areas are further disturbed by cultivation, overuse, road and project construction. These disturbed areas are more susceptible to erosion because of the increased area of bare soil. Soils that already show symptoms of erosion are adversely impacted by any soil-disturbing activities, which do not result in an increase of vegetation. Rehabilitation of these soils is more difficult because of past losses of topsoil and nutrients.

The erosion hazard rating is a measure of the susceptibility of a soil to erosion when bare of vegetation. The soils on public land in the Resource Area have generally severe erosion hazard ratings from both wind and water due to the slope of the land, the kind and amount of ground cover, salt and/or sodium content, and low organic matter content in surface layers. Approximately 28,463 acres of the Resource Area is unsuitable for livestock grazing and no forage is apportioned for these lands due to slopes steeper than 50 percent, sandstone or shale outcrops. This information is presented in Table 3-1 (Class VIII in LCC table).

When plant cover is reduced by grazing or other factors, sheet, rill, gully, and wind erosion usually result. This causes a further loss of soil and vegetative productivity as well as offsite sedimentation damage.

Soil displacement from trampling by livestock and wildlife is a form of erosion similar to water erosion. Like water erosion, trampling displacement is more evident as slopes increase. This form of erosion occurs most readily when the soil is very wet or very dry.

Vegetative ground cover is needed to protect soils from accelerated erosion caused by overgrazing, construction, and other surface disturbance. Runoff and soil loss can be prevented by prudent management. (See Table 3-2 for specific soil cover target values.) The most effective means to control both wind and water erosion is by maintaining a suitable, diverse vegetative ground cover and by minimizing soil disturbance.

Grazing systems that incorporate deferment or rest are more effective in reducing erosion than annual season-long use. If livestock grazing were eliminated or substantially decreased, plants would initially respond with increased vigor, resulting in increased ground cover. This would reduce bare ground and erosion potential.

Table 3-3 presents the average soil losses from all soils and types of management of rangeland by major land resource area. Table 3-4 shows acres within the MLRAs by condition class.

TABLE 3-1

LAND CAPABILITY CLASSES FOR M AND I ALLOTMENTS

	Potential Arable Cropland Acres			Grazing, Watershed and Wildlife Acres			Watershed, Wildlife and Scenic Acres	
County	II	III	IV	VI	VII	VIII	Unknown[1]	Total
Butte	—	974	2,782	78,711	7,267	21,197	22	110,953
Fall River	—	102	173	1,110	538	224	13	2,160
Harding	25	361	493	8,046	631	1,776	103	11,435
Meade	—	1,595	2,605	12,667	7,028	3,649	66	27,610
Pennington	—	217	193	1,478	5,238	856	—	7,982
Stanley	35	—	—	1,099	5,592	760	59	7,545
Totals	60	3,250	6,245	103,112	26,293	28,463	263	167,686

[1] These acres include water and soil inclusions which were not given a land capability classification.

Source: BLM, 1984

TABLE 3-2

SOIL COVER TARGET BY RANGE SITES

(Percent Ground Cover)

	Major Land Resource Area (MLRA)				
Range Sites*	58	60	61	62	63
Subirrigated	—	—	97	—	—
Overflow	—	—	97	97	—
Loamy Overflow	95 **	95	—	—	—
Clayey Overflow	95	95	—	—	—
Saline Lowland	85	85	—	—	—
Closed Depression	80	80	—	—	—
Loamy Terrace	95	95	—	—	—
Sands	90	90	—	—	—
Sandy	95	95	95	—	—
Silty	95	95	95	95	95
Clayey	95	95	95	95	95
Thin Upland	75	75	80	80	—
Shallow	83	83	83	83	—
Shallow Clay	83	83	—	—	87
Claypan	70	70	—	—	—
Dense Clay	80	80	—	—	80
Shallow to Gravel	70	70	—	—	—
Shallow Dense Clay	60	60	—	—	—
Thin Claypan	50	50	—	—	55
Very Shallow	50	50	—	—	—
Saline Upland	45	45	—	—	—
Porous Clay	—	—	75	—	—
Clay Savannah	—	—	50	—	—

*Significant soil/range sites.

**These numbers are percent ground cover.

—No data entry indicates that a range site is not mapped on public lands in the MLRA.

Source: SCS Range Site Technical Guides

TABLE 3-3

AVERAGE RANGELAND EROSION RATES

MLRA	T/A/yr
58	0.5
60	1.3
61	2.3
62	0.7
63	1.7

The allowable soil loss tolerance (T factor) used in the Universal Soil Loss Equation (USLE) is currently under review. This review may well reduce the T factor for rangeland soils.

T/A/yr — Tons/Acre/Year

MLRA — Major Land Resource Area

Source: U.S.D.A. S.C.S. 1982 Preliminary National Resource Inventory Information

Four-Winged Saltbrush

TABLE 3-4

RANGELAND CONDITION (ACRES)

MLRA	Excellent	Good	Fair	Other[1]	Total
58	3,844	8,211	1,716	3,675	17,446
60	4,456	76,170	29,477	23,151	133,254
61	—	4,235	547	352	5,134
62	—	2,503	—	47	2,550
63	—	8,022	—	1,238	9,260
TOTAL	8,300	99,141	31,740	28,463	167,644

[1] This includes acres which were not conditionable, e.g., water, barren areas and rock outcrops.

MLRA — Major Land Resource Area

Source: BLM, 1984

HYDROLOGY

Surface Water (Quantity and Quality)

Public lands in the Resource Area are drained by tributaries of the Missouri River. The major tributaries include the Grand, Moreau, Belle Fourche, Cheyenne, Bad, and Little Missouri Rivers.

Runoff from the ephemeral and intermittent tributaries results from snowmelt or intense summer storms. Since many of these smaller tributaries are underlain by Pierre shale or other heavy clay soils, runoff from intense rainfall is rapid and often changes from zero to flood stage within a single day.

Surface runoff is sometimes used for flood irrigation through a system of detention dams and spreader dikes. Another use is for livestock watering from small retention structures. There are no commercial or municipal uses of surface water on public lands in the Resource Area.

Water quality is variable due to the highly erratic discharge. The water is of relatively poor quality for use most of the time. Total dissolved solids (TDS) range from 200 parts per million (ppm) at high flows to 4000 ppm at low flows. Sodium and sulfate concentrations in the heavy clay soils and irrigation return flows contribute most of the TDS. Major ions include calcium, magnesium, sodium and sulfate (WRD—South Dakota 1982).

Groundwater

South Dakota is underlain by consolidated to semiconsolidated sedimentary rocks of Paleozoic, Mesozoic and early Tertiary age. These rocks are overlain in western South Dakota by semiconsolidated to unconsolidated sediments of middle and late Tertiary age. Groundwater reservoirs in these rocks constitute a large and reliable source of water for municipal and industrial use but is generally too deep for stock or domestic use. Most of western South Dakota is underlain by one or more aquifers that yield small to very large supplies of water of varying quality.

Shallow groundwater is absent or scarce in most of the area. Recharge to the shallow aquifers where they do occur is largely through infiltration of precipitation that falls upon the immediate area. The mechanics of recharge to the deeper aquifers are not fully understood, however, some recharge undoubtedly occurs in the Black Hills where streams cross exposed surfaces of the aquifers.

Shallow groundwater can be obtained from the Fox Hills-Hell Creek and Tertiary rocks of the Fort Union formation. The only public lands overlying these aquifers are in Harding and Perkins counties. Small to moderate yields can be expected from the Fox Hills-Hell Creek at depths up to 250 feet. Water quality ranges from highly mineralized to good and is used for stock, domestic and municipal supplies. The Fort Union supplies moderate amounts to farms and ranches from depths to 420 feet. The water is saline, has a high sodium sulfate content and is barely potable.

Shallow water can also be obtained from alluvial deposits located in the larger stream valleys throughout the area. Yields and water quality are highly variable and range from five to over 100 gallons per minute (GPM); however, most wells are in the 10-20 GPM range. The quality ranges from good to highly mineralized, with most wells suitable only for stock use. High concentrations of sodium and sulfate are the principal deterrents for domestic use.

Water from deeper aquifers underlies most of the public land in South Dakota. However, the costs of drilling, pumping and supplying power to the pumps makes deep aquifers use as domestic and stockwater prohibitive in most of the Resource Area. Deeper aquifers will not be affected by any of the alternatives listed in Chapter 2 and will not be discussed further.

Sedimentation

Reasons for high suspended sediment concentrations and discharges are due to locally steep topography, shallow soils, and less resistant types of bedrocks. Concentrations range from 500 ppm in parts of the Black Hills to 30,000 ppm in the Bad River Basin.

Most of the annual sediment discharge occurs during a few days of the year. Ninety percent or more may be discharged during short periods of rapid runoff resulting from summer thunderstorms or rapid snowmelt, although sediment concentrations during snowmelt runoff will generally be less than in an equal volume of runoff generated by thunderstorms. In general, sediment concentration and discharge will increase as streamflow increases.

Nearly all the suspended-sediment load of streams in western South Dakota is silt and clay; very little sand is transported in suspension.

The construction of dams, reservoirs, pits and spreader systems results in marked changes in sediment concentration and discharge. Nearly all the sediment that enters a reservoir on a major stream is trapped. Water released from these reservoirs contains very little sediment.

Sediment concentrations and yields vary greatly within any given watershed. Sediment data collected from a major stream can lead to erroneous conceptions about uniform erosion sediment concentrations and yields throughout a basin. The data for such streams should be considered as a composite of data from innumerable small basins. A large percentage of the sediment load may be coming from a small part of the basin. The data is useful when determining the amount of space that should be allocated for sediment storage in reservoirs, but is not particularly useful for determining the source of sediment within a basin.

Water Rights

Recently, the plan for statewide adjudication has been delayed indefinitely by the State of South Dakota.

The current practice followed by the state is the filing of a location notice for a water development. The BLM area office has been following this practice only for the past year or two.

Projects of record include 314 reservoirs, five wells, five developed springs and three waterspreaders. All new water developments will be filed upon completion.

RANGE

Vegetation

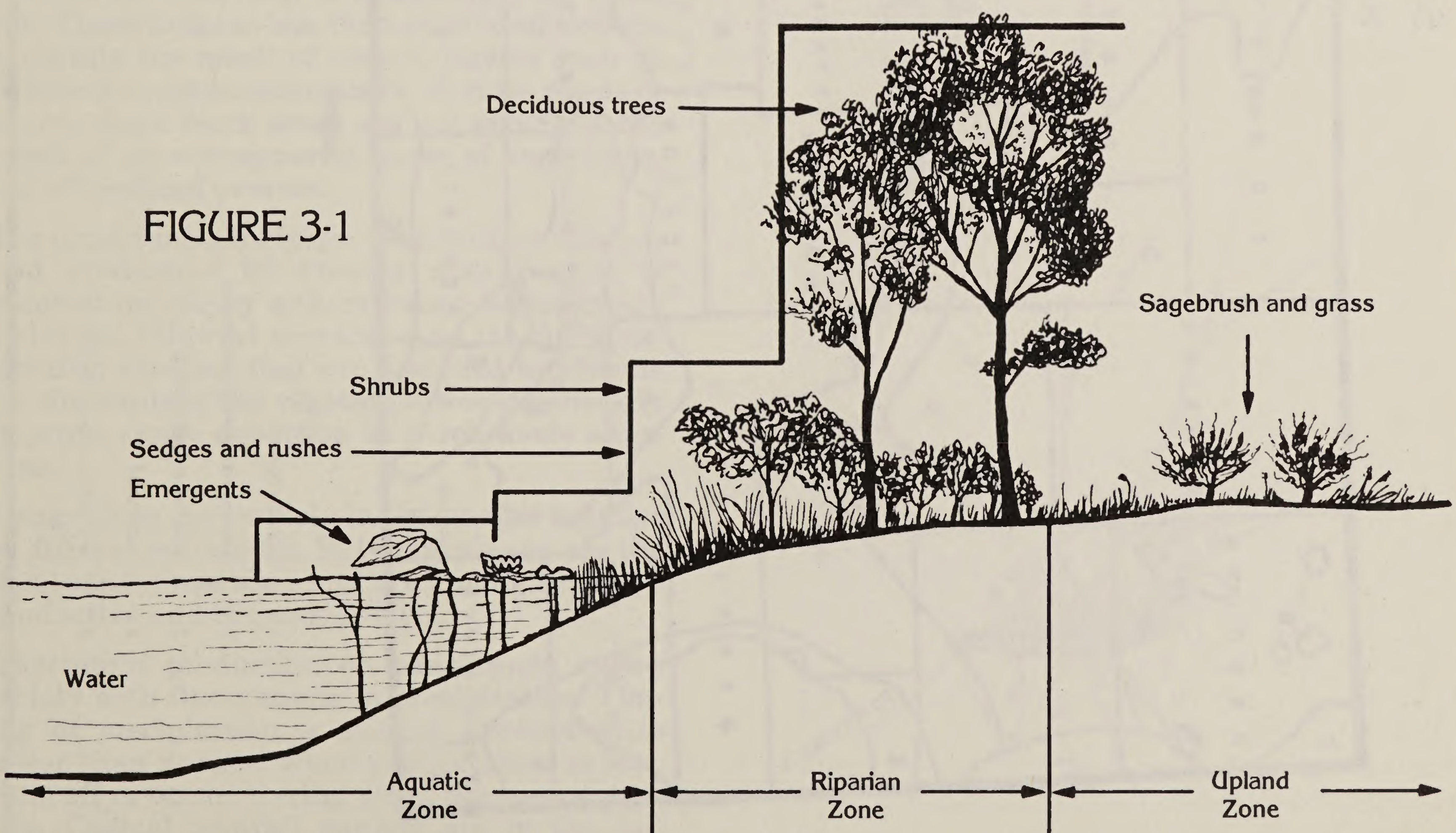
The vegetation community on public lands within the Resource Area is comprised of the following major types: wheatgrass-needlegrass, wheatgrass, wheatgrass-grama grass, wheatgrass-grama grass-buffalo grass (badlands), sagebrush-grass, pine-savannah, Black Hills pine forest, and Sand Hills prairie. (See Map 3-3.) From these types, an apportionment of forage to livestock, wildlife and watershed is made to benefit vegetation management. The dominant grass on most of the public lands is wheatgrass. Areas within the Resource Area which have more than 10 percent canopy cover of trees are classed as grazable woodlands.

Riparian zones are defined as a specialized form of wetland producing specific vegetation types. (See Figure 3-1.) Riparian zones may include wet or subirrigated areas with vegetation common to wetland, subirrigated, saline lowland, and overflow on closed depression range sites. The relative vegetation composition (by weight) of grasses, forbs, and trees and shrubs on each range site is shown in Table 3-5.

Riparian zones are used disproportionately more than any other vegetation type for livestock grazing, watering, shade, travel, and wildlife habitat.

Riparian woody vegetation may include silver sagebrush, snowberry, rose, willow, lead plant, skunkbrush, buffaloberry, box elder, elm, chokecherry, cottonwood, etc. Floodplains and overflow range sites are often adjacent to riparian zones and have vegetation typical of upland sites which receive additional moisture from overland flow.

FIGURE 3-1

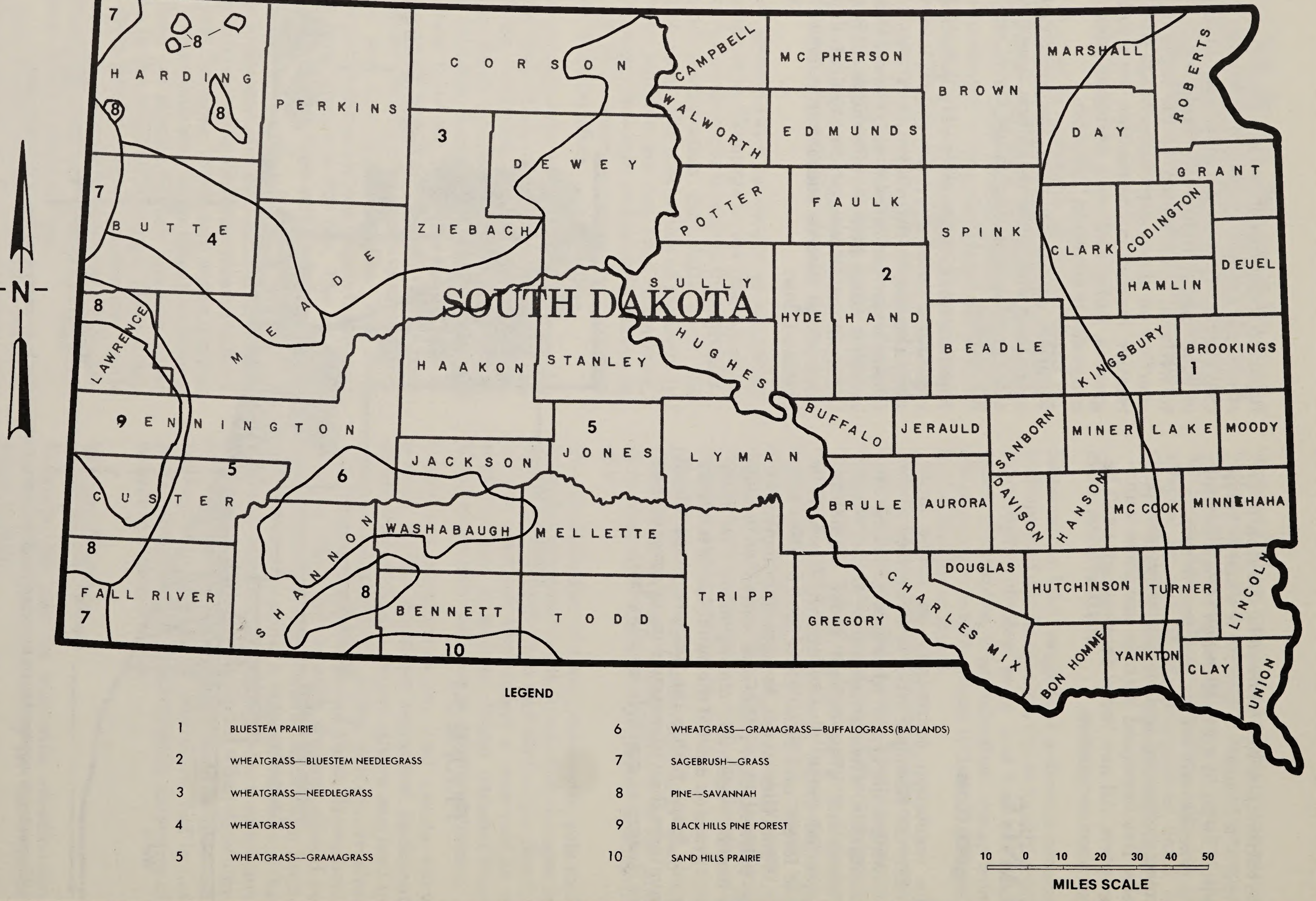


Riparian zones are identified by the presence of vegetation that requires large amounts of free or unbound water.

From: Thomas, J.W.; Maser, C.; and Rodier, J.E. 1979. Riparian zones in managed rangelands — their importance to wildlife. *In* Forum — Grazing and Riparian/Stream Ecosystems. Ed. Oliver B. Cope, Trout Unlimited.

South Dakota

Natural Vegetation



MAP 3-3

TABLE 3-5

RIPARIAN RANGE SITE VEGETATION COMPOSITION
(Percentage by Weight)

Range Site	Grasses	Forbs	Trees and Shrubs
Wetland	85-95	5-10	0-5
Subirrigated	90-100	0-10	0-5
Saline Lowland	65-95	5-10	5-25
Overflow	65-95	0-15	0-15
Closed Depression	90-100	0-10	—

From: USDA-SCS South Dakota Technical Guides for MLRAs 54, 58D, 60A, 61, 62 and 63.

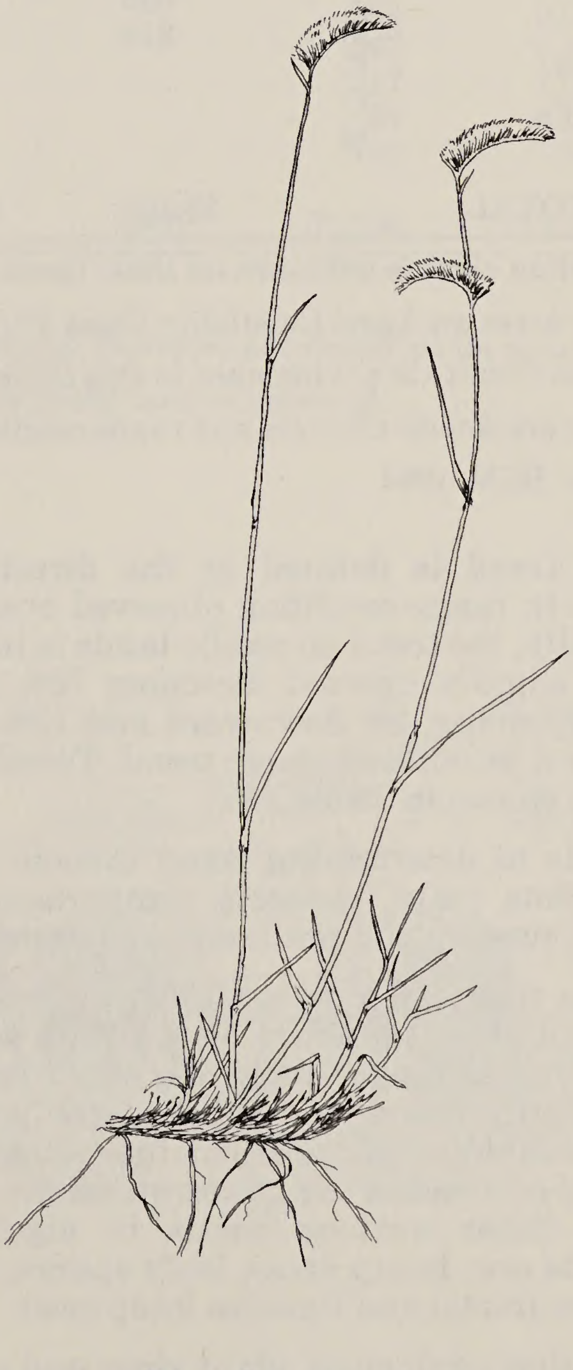
Range Condition, Production and Trend

Ecological range condition expressed as excellent, good, fair, poor or unclassified, reflects the current vegetation composition of the rangeland in relation to the potential climax plant community. The ecological range condition of the public lands is 9% excellent, 60% good, 17% fair and the remaining 14% are either not grazable or the condition is unknown. (See Table 3-6.) Those areas in less than good condition are generally the result of several factors such as livestock concentration areas, noxious weeds or prairie dogs. Such areas are not generally the result of an overapportionment of vegetation, but of localized overuse.

The opportunity for improving range condition and production by grazing management is greatest on clayey and/or loamy sedimentary uplands, alluvial terraces and floodplains. Grazing systems that are designed to provide for the needs of the vegetation would generally improve range condition in a relatively short time.

Range sites vary widely in production because of differences in soils. Silty and clayey are the dominant range sites and are among the more productive and responsive sites.

Vegetation production on rangelands varies widely with fluctuations in precipitation. Timing of precipitation is critical. Production is lower than normal when precipitation is low, runs off or occurs during plant dormancy periods. Critical rainfall periods are in the fall before freeze-up and in the spring during early plant growth of the dominant cool season grasses.



Blue Grama

TABLE 3-6

ACRES OF PUBLIC LAND BY RANGE CONDITION CLASS, MANAGEMENT CATEGORY AND COUNTY

	Mgmt			Condition			
County[3]	Cat	Excellent	Good	Fair	Unknown[1]	None[2]	Total
Brule	C		505			15	520
Butte	C	2,359	19,623	8,999	1,060	2,272	34,314
	I			7 ,712		1,442	9,154
	M	1,486	67,528	13,030		19,755	101,799
Custer	C		2,509	466	150	454	3,579
Fall River	C	40	2,609	2,348			4,997
	I		947	547		147	1,641
	M		442			78	520
Haakon	C		600		569		1,169
Harding	C	10,924	6,886		931	29	18,770
	M	4,562	2,959	2,138		1,776	11,435
Jackson	C	160	240				400
Lawrence	C				2,425*		2,425
Meade	C	1,082	8,968	1,697	2,696		14,443
	I		5,552	7,143		3,081	15,775
	M	1,385	9,839			568	11,792
Pennington	C	240	6,443	530	1,016	161	8,390
	I	655	1,082	495		294	2,526
	M	212	4,006	675		562	5,455
Perkins	C		7,484	131		347	7,962
Stanley	C		8,462			58	8,520
	M		6,785			760	7,545
TOTAL		23,105	163,468	45,911	8,847	31,799	273,131

[1] Condition class is unknown on these areas.

[2] These acres are Land Capability Class VIII lands, and not rangeland, therefore not condition classed.

[3] Lyman County is not included in this table because the 80 acres of public land is unleased.

*These are woodland acres and range condition ratings do not apply.

Source: BLM, 1984

Range trend is defined as the direction of change in range condition observed over time. Generally, the trend on public lands is in a stable or slightly upward direction: 73% stable, 10% improving, 2% downward and 15% either unknown or without range trend. Trend specifics are shown in Table 3-7.

Methods of determining trend include phototrend plots, point transects, comparison of recurrent surveys and professional judgment.

Canada thistle is a perennial weed which has created a serious problem by infesting western South Dakota ranges, including public lands. It is generally found in small isolated patches, spreads rapidly and is difficult to eradicate. The acres of occurrence are unknown on the public lands. Other noxious weeds in significant amounts are: hoary cress, leafy spurge, perennial sow thistle and Russian knapweed.

Vegetation production, plant vigor and ground cover are greatly reduced on prairie dog towns. Range condition on prairie dog towns is usually poor because of the continual clipping of vegetation and the conversion of the plant community to invader and low successional plants.

No endangered plant species are known to occur in South Dakota. Two threatened species (both orchids) have been found on moist meadows in eastern South Dakota. Forty-six rare plant species occur in the area (Van Bruggen 1980).

Livestock

There are 444 grazing allotments in the Resource Area. (See Appendix B.) Eighty-two percent of the allotments run cattle, 16% sheep and the remaining 2% run more than one class of stock. These allotments, which include all of the M, I and C category allotments, are authorized to graze a total of 73,778 AUMs. The M and I allotments are authorized to graze a total of 45,305 AUMs.

The 444 allotments are separated into three categories: Maintain (M), Improve (I), and Custodial (C). There are 55 M, 13 I, and 376 C allotments. (See Table 3-8.)

TABLE 3-7

ACRES OF PUBLIC LAND BY MANAGEMENT STATUS, TREND, COUNTY

County[3]	Mgmt Cat	TREND					
		Increasing	Stable	Declining	Unknown[1]	None[2]	Total
Brule	C				505	15	520
Butte	C	1,430	28,631	921	1,060	2,272	34,314
	I	1,442	7,712				9,154
	M	8,302	73,405			20,092	101,799
Custer	C	1,909	1,066		150	454	3,579
Fall River	C	79	3,000	1,918			4,997
	I		1,494			147	1,641
	M		442			78	520
Haakon	C	160	360		649		1,169
Harding	C	3,249	14,295	266	931	29	18,770
	M		9,659			1,776	11,435
Jackson	C		400				400
Lawrence	C				2,425		2,425
Meade	C	1,624	9,507	616	2,696		14,443
	I	5,541	7,153			3,081	15,775
	M		11,224			568	11,792
Pennington	C	798	6,415		1,016	161	8,390
	I	517	1,715			294	2,526
	M		4,893			562	5,455
Perkins	C	108	5,897	1,610		347	7,962
Stanley	C		8,462			58	8,520
	M	2,190	4,595			760	7,545
TOTAL		25,970	200,324	5,331	9,432	32,136	273,131

[1] Trend is unknown on these areas.

[2] These lands are Land Capability Class VIII lands, and not rangeland, therefore not classified for trend.

[3] Lyman County is not included in this table because the 80 acres of public land is unleased.

Source: BLM, 1984

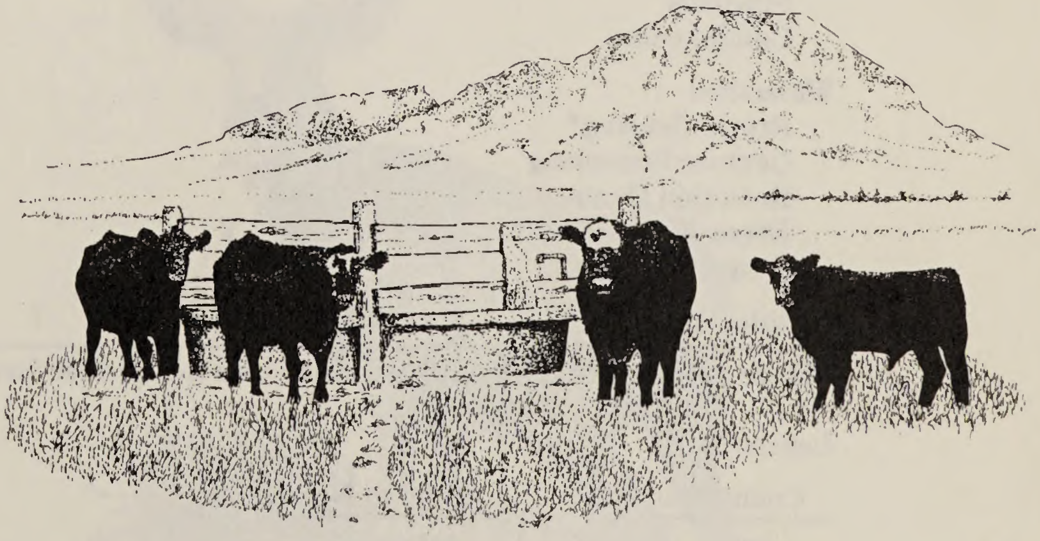
TABLE 3-8

ALLOTMENTS BY CATEGORY AND COUNTY

	C	I	M	Total
Brule	1	0	0	1
Butte	73	5	33	111
Custer	13	0	0	13
Fall River	36	2	1	39
Haakon	14	0	0	14
Harding	89	0	7	96
Jackson	4	0	0	4
Lawrence	11	0	0	11
Meade	61	6	8	75
Pennington	30	3	5	38
Perkins	34	0	0	34
Stanley	26	0	6	32
Area Total	376	13	55	444

*This table shows the number of allotments in each category and county. Some allotments lie in more than one county, therefore, column totals will not equal the number of allotments in each category.

Source: BLM, 1984



BLM administers four AMPs. Rest rotation grazing is applied to about 28,000 acres, while about 5,700 acres are under deferred rotation.

Grazing may begin as early as March and extend through December on some allotments. For most operations, the total grazing period on public and private lands is April-November, a total of 7 to 8 months. Livestock are generally fed hay and supplements on winter pastures. The overall average dependency upon public lands is less than 20 percent, although many operations depend heavily on the public lands, especially during spring and summer.

The availability and quality of water are limiting factors on some allotments and may cause disruptions to grazing during unusually dry years.

There are 692 range improvements of record on the public lands which have been developed for watershed and livestock management. An average of 10 range improvements have been replaced or maintained in each of the past 5 years (an average of two fence projects and eight water developments per year). Tables 3-9a and 3-9b show the type and size of projects, respectively.

Range surveys and adjudications in the late 1950s and early 1960s established current livestock and wildlife apportionments.

TABLE 3-9a
NUMBER OF EXISTING PROJECTS BY COUNTY, TYPE AND PURPOSE

Purpose and Type	015	019	033	047	055	County 063	071	081	093	103	105	117	Total
Stock Management													
3-wire fences		18		2		18		4	14	8	5	9	78
4-wire fences		74	2	3		21		1	9	3	2		115
Woven wire fences		108				20			4		1		133
Total Fence Projects		200		5		59		5	27	11	8	9	326
Enclosure/Exclosure		8							1				9
Corrals		2							1				3
Cattleguards		1							3				4
Passes						1			3				4
Road								1					1
Springs									5				5
Wells						1			4				5
Reservoirs		239		2		26			32	3		12	314
Pipelines						1			4				5
Catchments									1				1
Watershed													
Brush Clearing*		4							1				5
Contour Furrowing		4											4
Retention Dams						1							1
Dikes/Diversions		2				1							3
Drop Structures		1							1				2
(Totals)	0	461	2	7	0	90	0	6	83	14	8	21	692

*These projects are generally associated with the contour furrowing as a pretreatment

Legend:

County No.	County Name	County No.	County Name
015	Brule	071	Jackson
019	Butte	081	Lawrence
033	Custer	093	Meade
047	Fall River	103	Pennington
055	Haakon	105	Perkins
063	Harding	117	Stanley

Source: BLM, 1984

TABLE 3-9b
SIZE (LENGTH OR ACRES) OF PROJECTS BY COUNTY, TYPE AND PURPOSE

	County												
Purpose and Type	015	019	033	047	055	063	071	081	093	103	105	117	Total
Stock Management													
3-wire fence		21		2		10		13	9	7	3	10	75
4-wire fence		75	4	4		13		1	21	1	1		120
Woven Wire		140				14			11		1		166
TOTAL MILES		236	4	6		37		14	41	8	5	10	361
Watershed													
Brush Removal*		656							10				666
Contour Furrowing		773											773
TOTAL ACRES		1429							10				1439
Dikes/Diversions		1459				1650							3109
TOTAL FEET		1459				1650							3109

*These projects are generally associated with contour furrowing as a pretreatment. Water developments are shown on Table 3-9a.

LEGEND:

County No.	County Name	County No.	County Name
015	Brule	071	Jackson
019	Butte	081	Lawrence
033	Custer	093	Meade
047	Fall River	103	Pennington
055	Haakon	105	Perkins
063	Harding	117	Stanley

Source: BLM, 1984

WILDLIFE

Public lands are a major source of wildlife habitat in western South Dakota. Public land, which is often in a natural or seminatural state, provides the diversity of habitat needed by wildlife for food and cover. It is the policy of the BLM (FLPMA 1976) to consider wildlife habitat in its multiple use management. Habitat management, not species or population management, is a primary responsibility.

Four major habitat types which support a wide variety of wildlife species occur on public land. These habitat types include: grasslands, grassland/shrubland, coniferous forest and riparian.

Grasslands are the most widespread habitat type within the Resource Area. Common plants found on grasslands include: western wheatgrass, green needlegrass, little bluestem, Kentucky bluegrass, junegrass, blue grama, sedges, yellow sweetclover and numerous other forbs.

The grassland/shrubland habitat type consists of areas where shrub species occur along with

grasses. In addition to the plants listed above, one or more of the following shrubs would be present: big sagebrush, silver sagebrush, greasewood or four-winged saltbush.

The coniferous forest habitat type consists of areas where ponderosa pine or western juniper comprise a large portion of the canopy cover. Most of the ponderosa pine areas occur within the foothills of the Black Hills, while western juniper is found in the Belle Fourche and Cheyenne River breaks.

The riparian habitat type is characterized by one or more species of hardwood trees. Commonly found trees include cottonwood, American elm, green ash, willows and bur oak. In most instances, riparian habitat types will be found in conjunction with stream or river bottoms.

There is an extremely scattered land pattern of federal ownership throughout the Resource Area. This scattered land pattern makes it all but impossible to determine wildlife numbers on federal land. Little data is available from the South Dakota Department of Game, Fish and Parks for the Resource Area. Most information comes from the county conservation officers. This information is mostly in the form of educated guesses and very little information is documented. Few critical areas for wildlife have been identified on the public land. This is not to say that critical areas do not occur on the public land, but that little emphasis has been directed to locating these areas.

Threatened and Endangered Species

The black-footed ferret, southern bald eagle, peregrine falcon, whooping crane and Eskimo curlew are on the Federal Endangered Species list. Prairie dog towns on the public land may provide suitable habitat for the ferret. Bald eagles migrate through the area and winter along the Belle Fourche River, Cheyenne River, Missouri River, Bad River, Redwater River, and Bear Butte Creek. Potential nest sites do occur on public land for the peregrine falcon. Whooping cranes migrate through the state and occasionally are seen on stock dams. Potential habitat for the Eskimo curlew exists throughout the prairie. Osprey and buff-breasted sandpipers may be found near any large body of water. The interior least tern may be found along any of the rivers. Like the ferret, the northern swift fox is closely associated with prairie dog towns. River otters may be associated with any of the perennial rivers and streams.

There is no known resident mountain lion population in the Resource Area. However, they may be observed in the area.

Potential habitat may occur in the rivers and creeks for the following species of fish: pallid sturgeon, sturgeon chub, sicklefin chub, northern redbelly dace, finescale dace, longnose sucker and plains topminnow. The finescale dace and longnose sucker could be found in the Black Hills while the others would probably be restricted to the larger rivers.

The South Dakota Department of Game, Fish and Parks identified species as threatened or endangered, which includes the species on the Federal Threatened and Endangered Species list. These species are as follows:

ENDANGERED	THREATENED
Black-footed ferret	Northern swift fox
Southern bald eagle	River otter
Peregrine falcon	Mountain lion
Whooping crane	Black bear
Eskimo curlew	Osprey
Central mud minnow	Buff-breasted sandpiper
Pearl dace	Blandings turtle
Banded killifish	False map turtle
Interior least tern	Spiny softshell turtle
	Eastern hognose snake
	Brown snake
	The lined snake
	Northern red-bellied snake
	Pallid sturgeon
	Sturgeon chub
	Sicklefin chub
	Northern redbelly dace
	Fine scale dace
	Longnose sucker
	Trout-perch
	Plains topminnow

Big Game

Antelope are found throughout the Resource Area. They are normally associated with grasslands or grassland/shrublands habitat types. Forbs are very important in their diet in the early spring. Sagebrush is used year-round and its availability may be critical during severe winters. Antelope are considered to be generally nonmigratory in South Dakota, however; some seasonal movement may occur.

Mule deer can be found in all habitat types in the Resource Area. They tend to prefer the grassland/shrubland, coniferous forest, and riparian habitat types. Mule deer seem to seek out the rougher, more broken land. Browse is an important part of their yearly diet. Some seasonal movement does occur in parts of the Resource Area.

Whitetail deer are associated with riparian and coniferous forest habitat types. They are normally found in ponderosa pine forests and are rarely found among the western junipers. River bottoms are particularly important within the Resource Area. Migration is limited throughout most of the state. Some seasonal movement does occur in the Black Hills area.

Game Birds

Probably no species in South Dakota is more dependent upon the public land than the sage grouse. Sage grouse are limited to Harding, Butte and Fall River counties. In Butte County there are eight known active leks, six of which are located on or within one-half mile of public land. Sage grouse are considered generally nonmigratory. A two-mile radius around leks is considered critical on a year-round basis. This distance could be greater in some instances. Sagebrush is critical habitat year-round, especially in the spring as nesting cover and in the winter for food and cover.

Sharptail grouse are widely distributed throughout the Resource Area and are generally found on the grasslands where brushy draws are present. Only three leks have been identified in the Resource Area. Several more may exist but have never been documented.

Turkeys are associated with coniferous forest and riparian habitats. Huntable populations occur along the Cheyenne, Belle Fourche, Moreau, Little Missouri, and Missouri River bottoms, as well as throughout the Black Hills area.

Waterfowl are found statewide. Production is keyed to suitable habitat around stock dams, lakes and rivers. Ducks are found on most stock dams, while geese are found on the larger reservoirs or along the rivers. One pair of swans is known to nest near a reservoir located on public land within the Resource Area.

No other game birds exist in significant numbers in the Resource Area on BLM administered lands to warrant discussion.

Other Wildlife

Numerous nongame mammals, birds, and reptiles occur within the Resource Area. Mammals of importance include the furbearers (fox, coyotes, bobcat, beavers, skunk, mink, and badger), the black-tailed prairie dog and others. Also, raptors are of importance with special emphasis on golden eagles and burrowing owls.

Fisheries

Fisheries within the Resource Area are varied, but primarily confined to the Belle Fourche and Cheyenne rivers, Bear Butte Creek and stock dams.

Fish found in these waters include rainbow and brook trout, bluegill, walleye, sauger, yellow perch, largemouth bass, smallmouth bass, catfish, and numerous nongame species.

LANDS

There is a total of 280,672 acres of public surface estate and 5,294,122 acres of subsurface mineral estate under BLM administration. Included in the federal subsurface ownership are the Black Hills National Forest, the Buffalo Gap National Grasslands, the Custer National Forest, the Fort Pierre National Grasslands, and the Grand River National Grasslands. The majority of the surface estate, 278,673 acres, are within the study area of the following 13 counties—Brule, Butte, Custer, Fall River, Haakon, Harding, Jackson, Lawrence, Lyman, Meade, Pennington, Perkins, and Stanley. Many of the 278,673 surface acres within the study area are scattered and/or isolated tracts. This land ownership pattern is a result of those remaining less desirable areas being left over from the homesteading days in the late 1800's and early 1900's.

Table 3-10 shows BLM administered surface and BLM as a percent of the county. BLM surface accounts for less than two percent of all counties except Butte, in which about 10 percent of the surface is BLM-administered.

The fragmented ownership pattern of public land presents numerous management problems and often restricts use by the public. Adjustment of the land ownership pattern, preferably by exchange, could increase the management efficiency of federal resources in certain situa-

TABLE 3-10
COUNTY ACRES IN STUDY AREA[1]

County	BLM Administered Surface Acres	BLM As A Percent Of County
Brule	532	0.10%
Butte	145,851	9.94%
Custer	3,648	0.37%
Fall River	7,334	0.66%
Haakon	1,400	0.12%
Harding	29,880	1.74%
Jackson	240	0.04%
Lawrence	5,423	1.05%
Lyman	80	0.01% [2]
Meade	41,864	1.89%
Pennington	17,462	0.97%
Perkins	8,135	0.44%
Stanley	16,824	1.73%
GRAND TOTAL	278,673 [3]	

[1] Approximately 2,000 acres are outside the study area in Bon Home, Charles Mix, Clay, Hughes, Jones, Sully, Union and Yankton Counties.

[2] The percentage figure for Lyman County does not include the Lower Brule Indian Reservation acreage in the calculations.

[3] Approximately 6,400 acres of the total are unleased public lands, agricultural leases and Recreation and Public Purposes (R&PP) leases.

Source: BLM, 1984

tions and provide legal access to isolated tracts for use by the public for recreation or other purposes.

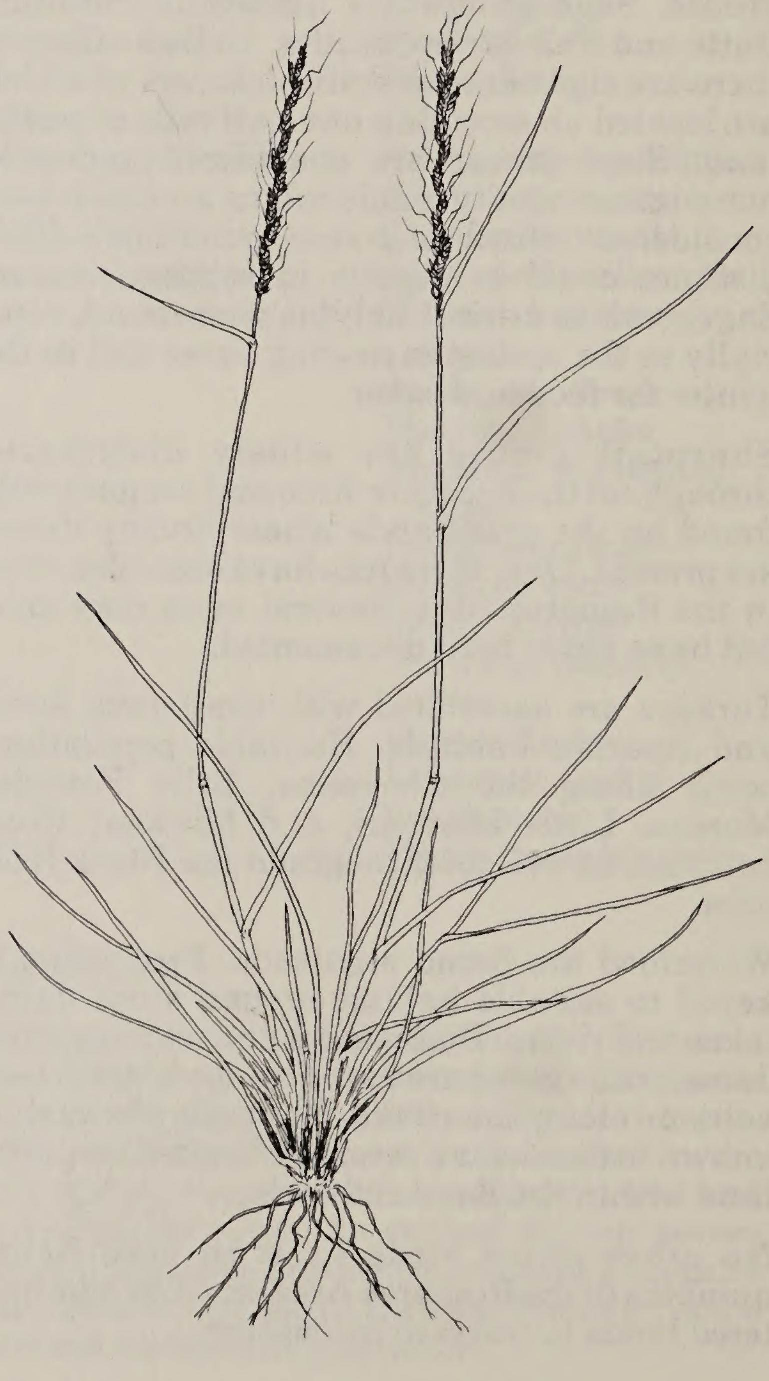
During the past year, 250 acres have been offered for competitive sale and 1,000 acres of scattered parcels have been considered for exchange.

Present Recreation and Public Purposes Act (R&PP) leases in the area include the muzzleloader range, and the Veterans of Foreign Wars picnic area and rifle range. Conveyances under the R&PP would be made to qualified applicants (state, county, local governments and nonprofit organizations) on a case-by-case basis. These conveyances usually result in a more beneficial publicuse such as wildlife reserves, land for schools and colleges, parks, recreation sites, cemeteries, museums, and fairgrounds.

A State of South Dakota-BLM exchange and a Forest Service-BLM exchange are in the proposal stage.

Other sales, exchanges and acquisitions are being considered as a result of management direction and public demand on a case-by-case basis. Public lands within the Resource Area classified for disposal meet all the requirements of Section 203(a) and 206(a) of FLPMA.

The Resource Area processes about 10 rights-of-way cases per year. Most rights-of-way applications are for new construction of rural electric and telephone lines or amendments to existing rights-of-way. Other rights-of-way requests are for roads, transmission lines, and other facilities authorized by the Mineral Leasing Act. Rights-of-way corridors across public lands have not been a major concern.



Green Needlegrass

CULTURAL RESOURCES

Few cultural properties have yet been recorded on BLM administered land in South Dakota. A 4,000-year-old prehistoric camp in Meade County, partially on public land, has been recorded. The significance of 23 other known sites on public land is undetermined.

Cultural sites document human occupation in the area from about 10,000 years ago to present. The Early or Paleoindian period dates from about 10,000 to 6,000 years B.C. The Middle or Archaic period is thought to date from 6,000 B.C. to A.D. 400. The Late Prehistoric period began about A.D. 400 with the adoption of the bow and arrow, and continued until the acquisition of the horse and European trade goods, about A.D. 1750.

Prehistoric sites are represented by rock art, bison kills, human burials, tipi rings, and other prehistoric campsites. Forest Service inventories also include rockshelters and rock art panels. The historic period, for which written records exist, is represented by forts, posts, and battlefields from the time of white/Indian conflict, and ghost towns, as well as evidence of historic mining activities and military occupation at Fort Meade. Numerous sites also exist from the settlement period when large cattle operations flourished, railroads were built, and much of the state was homesteaded. The significance of such properties is determined by the amount and integrity of the information preserved in them, and by the importance of the historic or prehistoric events which occurred there.

One site with BLM involvement, Fort Meade, is presently listed on the National Register of Historic Places. The Gant Site, 39 ME9, is located within Fort Meade and is considered eligible for the Register.

FORESTRY

There are 9,914 acres of woodland scattered throughout the Resource Area. (See Table 3-11.) Three main types exist: ponderosa pine, juniper and mixed hardwoods. This resource serves primarily as watershed protection and wildlife cover. Harvest rates average one sawlog sale per decade and 700 board feet of incidental juniper post sales annually.

TABLE 3-11

SUMMARY OF BLM WOODLAND ACRES BY COUNTY
(Outside of Exemption Area and Fort Meade)

County	Mixed Species (25-75%)[1]	Mixed Species (75+%)	Ponderosa Pine (25-75%)	Ponderosa Pine (75+%)
Harding	8	5	33	0
Pennington	4,827	293	0	0
Meade	2,518	8	0	0
Custer	446	17	144	100
Fall River	107	0	1,109.8	53.0
Perkins	244	0	0	0
TOTALS	8,151	323	1,287	153

[1] Percent crown closure

Source: BLM 1983

PALEONTOLOGIC RESOURCES

Legal protection of paleontologic material extends only to those fossils deemed significant (Antiquities Act of 1906, 16 USC 432, 433). Presently, vertebrate fossils are usually the only significant, therefore regulated, fossils. Removal of significant fossils from public land is authorized by issuing permits to qualified institutions.

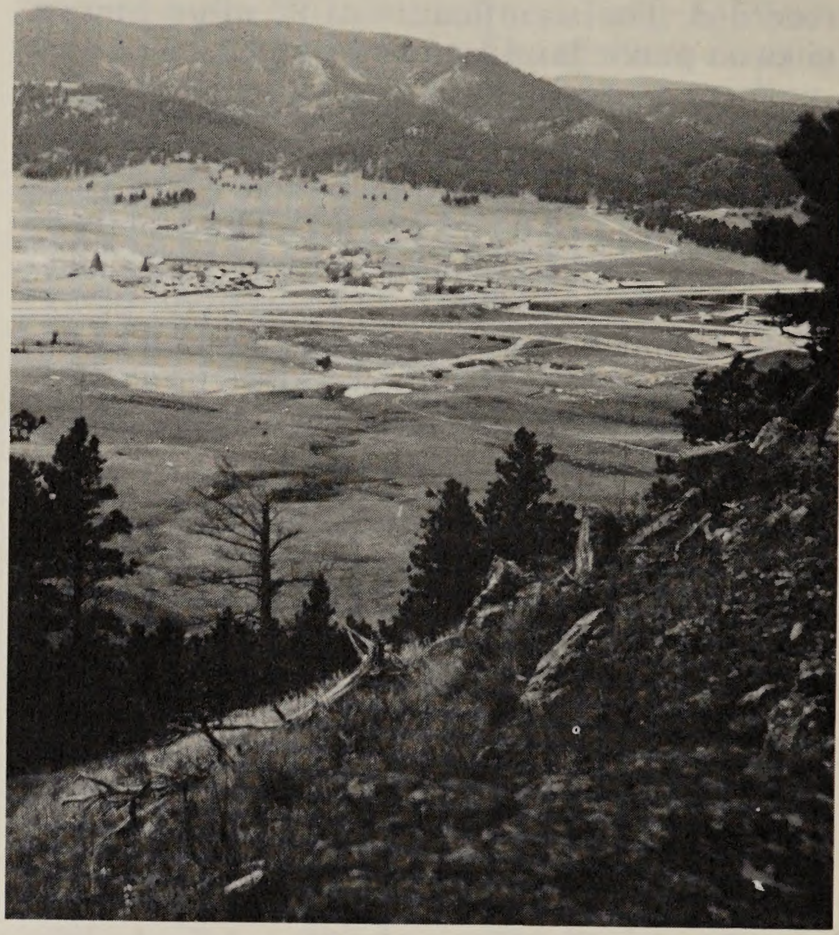
The Morrison formation, Lakota sandstone, and Hell Creek formation are noted for the dinosaur fossils they contain. The White River group is an important source of middle Tertiary mammals. A portion of the Pierre shale is known for the *Placenticeras* ammonites and marine reptiles found there. Plant fossils are commonly found in the Lakota sandstone, Fuson shale, and the Fort Union formation (Bjork, personal communication 1983.)

Localities and specimens are recorded as they are found by professional paleontologists or BLM personnel using a locality form and cataloging system. Collection by BLM personnel is limited to those instances where loss of the material is imminent, such as from earthwork activities or erosion. There are presently no active paleontology permits issued by BLM, although various institutions and groups are working in areas where there is public land.

RECREATION

Located within the boundaries of the 13 counties are many areas having recreational values. They include the Black Hills National Forest, Custer National Forest, Nebraska National Forest (consists mainly of national grasslands), Badlands National Monument, Wind Cave National Park, Custer State Park, several ski areas, the historic town of Deadwood, three major rivers, and five reservoirs. These areas offer a variety of dispersed recreational opportunities including fishing, photography, boating, hiking, rock collecting, sightseeing, hunting, and off-road vehicle (ORV) use.

The Bureau has two recreation sites, one near Sturgis and the other near Belle Fourche. The former involves 6,693 acres of the former Fort Meade Military Reservation and provides activities such as camping, picnicking, fishing, hunting, equestrian use, and sightseeing. It also has historical values, including reconstructed stone cavalry jumps, historic trails, and rock carvings. The BLM has completed a plan for recreation management for Fort Meade. The area near Belle Fourche is the Center of the Nation Recreation Area, recognized as a geographic center of the United States, which offers excellent scenic viewing.



Throughout the Resource Area, hunting and fishing are very popular types of recreation. Hunting consists primarily of big game and upland birds with limited waterfowl hunting.

Most of the public land administered by the BLM is in a scattered pattern, thus, this land has a supplemental role in the overall recreational activities.

MINERALS

The public mineral estate in South Dakota totals 5,294,122 acres with a surface estate of 280,672 acres. BLM has varied responsibilities on these lands according to who controls the surface over these minerals, the specific mineral type, and the public laws governing Public Domain and Acquired Lands. Categories of minerals of potential value include fuels (coal and oil and gas), metallics, industrials and nonmetallics, structural materials, and geothermal resources.

As of 1984, there were 86 producing federal oil wells and 26 producing federal gas wells in South Dakota. Cumulative state oil production as of 1984 was 12,000,301 barrels. Ninety-six percent of this production was in Harding and Butte Counties, with the remainder in Custer, Fall River, and Dewey Counties (Map 3-4a). Cumulative gas production was 9,505,554 million cubic feet (MCF). Ninety-one percent of this production was in Harding County, with the remainder in Fall River County. The lignite coal-bearing area of South Dakota is in the northwest and includes parts of Harding, Perkins, Meade, Ziebach, Dewey, and Corsen Counties. Currently, there is no active mining in the state, although there has been recent exploration activity. Estimates of potentially recoverable coal show a total of 640 million tons, 65 percent of which is in Harding County.

Aluminum, iron, magnesium, and manganese occur in significant quantities in the western counties of the state (Map 3-4b). The largest deposit of manganese in the nation is in the lower part of the Missouri Valley in South Dakota. The last activity in this area was during World War II. Gold and silver have been perennially the chief income producers in South Dakota's mining industry. These minerals occur in vein, replacement, and placer deposits of the Black Hills area. Tungsten, tin, beryllium, and primary uranium have been mined and are still present in pegmatite deposits of the Black Hills.

Limestone has ranked only behind gold in value of annual production. All mining activity has been in the Black Hills and is used primarily in the manufacture of Portland cement. Bentonite is common in Upper Cretaceous rocks and occurs over wide areas in the state (Map 3-4b). It is being mined in the Mowry Shale northwest of Belle Fourche. Extensive deposits of high-grade gypsum/anhydrite occur in Lawrence, Meade, Pennington, Custer, and Fall River Counties. Production is steady and geared for a small regional market. Salt beds of economic quantities are located in Harding and Butte Counties. To date, there is no development activity in South Dakota.

Granite in the Black Hills has historically been quarried on a small scale for building and riprap material. Sandstone and quartzite use exist in most of the western counties. Sand and gravel is used as a construction material is available in almost all areas of the state and continues to be a steady source of income.

There is no known interest in geothermal resources, although an area in Custer and Fall River Counties has been classified "prospectively valuable" by BLM (Map 3-4a).

ECONOMICS

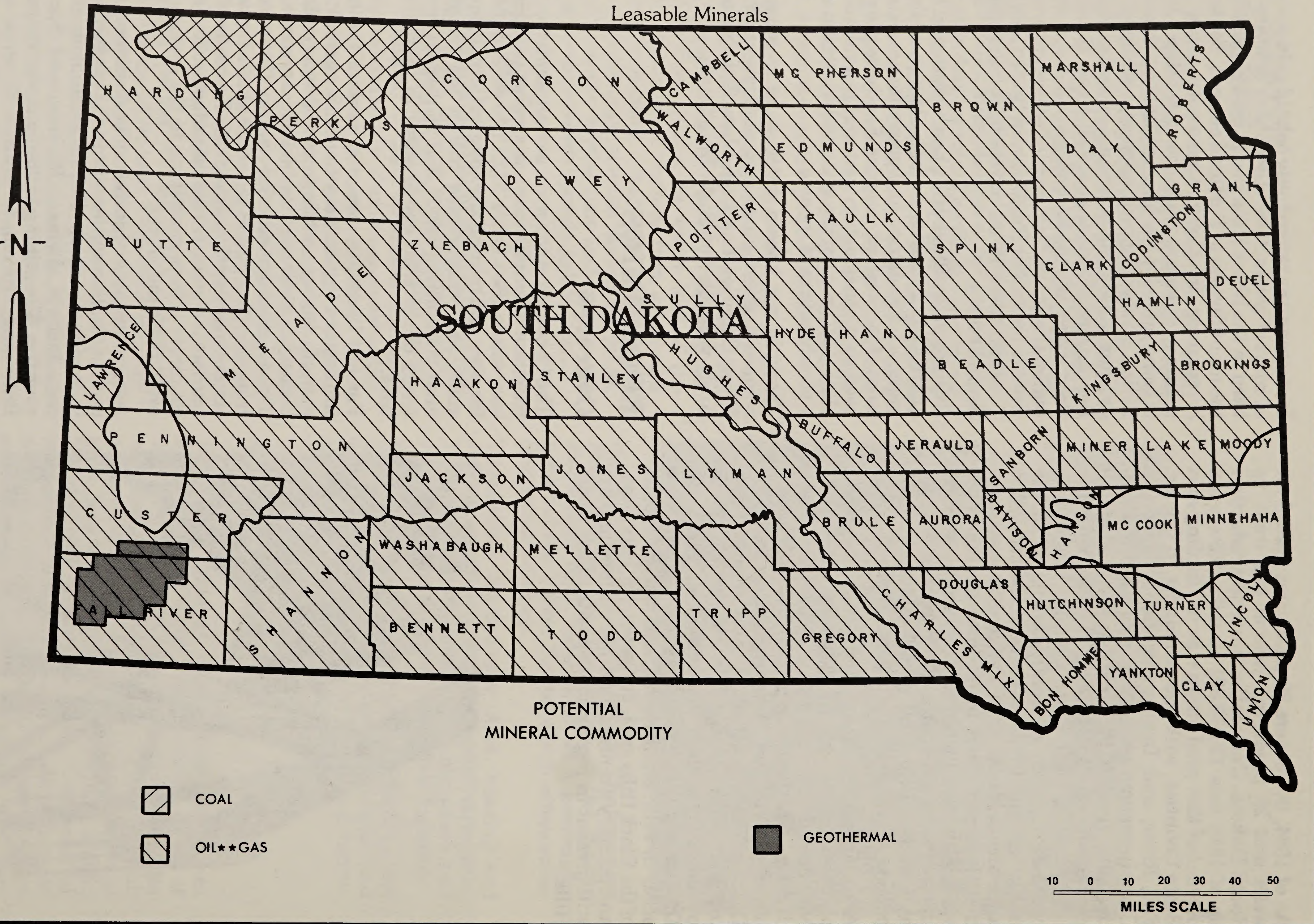
Overview

The 13-county study area, as represented by distribution of employment, is similar to the state as a whole. (See Table 3-12.) The exceptions are forestry and mining employment which, for the state, are concentrated within the 13-county area, accounting for 77 and 88 percent respectively of the total employment in these industries.

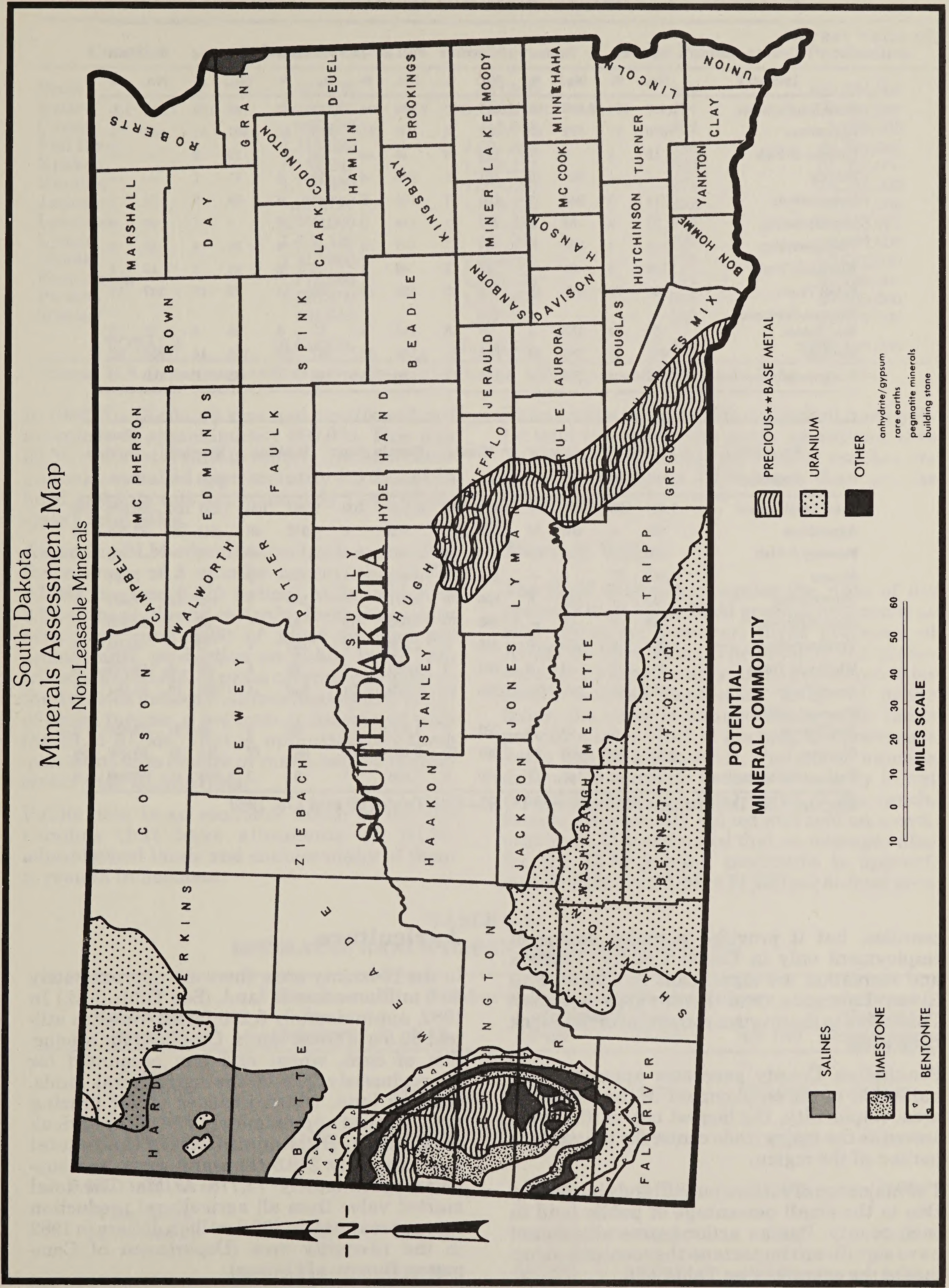
For the 13-county area, the rank of the basic industries (by employment) is agriculture, manufacturing, mining, and forestry. Basic industries are those for which most revenues are derived from outside the region. These industries are the major determinants of overall employment within a region. Recreation and tourism is considered a base industry. However, its direct effects contribute to the service and retail trade industries.

Agriculture is a significant base industry for each of the 13 counties within the study area. It is dominant in Brule, Fall River, Haakon, Harding, Jackson, Lyman, Perkins, and Stanley counties. The mining industry is significant in Butte and Lawrence counties. There is some forestry employment throughout the western

South Dakota
Minerals Assessment Map
Leasable Minerals



MAP 3-4a



South Dakota Minerals Assessment Map

Non-Leasable Minerals

MAP 3-4b

TABLE 3-12
EMPLOYMENT BY INDUSTRY

County— Industry	Brule No.	% 	Butte No.	% 	Custer No.	% 	Fall River No.	% 	Haakon No.	% 	Harding No.	% 	Jackson No.	%
Total Employment	2,490	100	3,528	100	2,575	100	3,356	100	1,205	100	748	100	1,117	100
Agriculture	670	27	772	22	237	9	367	11	406	34	401	54	344	31
Forestry & Fish	18	1	0	—	149	6	16	—	—	—	12	2	—	—
Mining	1	—	359	10	121	5	140	4	13	1	11	1	—	—
Construction	114	5	240	7	192	7	161	5	49	4	35	5	73	6
Manufacturing	53	2	64	2	277	11	114	3	115	10	7	1	40	3
Transportation	109	4	236	7	187	7	497	15	45	4	31	4	45	4
Wholesale Trade	129	5	94	3	48	2	46	1	77	6	11	1	10	1
Retail Trade	538	22	671	19	314	12	526	16	168	14	72	10	127	11
Finance, Insurance, Real Estate	94	4	153	4	76	3	141	4	57	5	21	3	22	2
Services	672	27	781	22	805	31	1,180	35	227	19	102	14	353	32
Public Administration	92	4	158	4	169	7	168	5	48	4	45	6	103	9

County— Industry	Lawrence No.	% 	Lyman No.	% 	Meade No.	% 	Pennington No.	% 	Perkins No.	% 	Stanley No.	% 	South Dakota No.	%
Total Employment	7,757	100	1,426	100	7,152	100	29,048	100	2,291	100	1,221	100	296,679	100
Agriculture	283	4	480	34	904	13	832	3	913	40	244	20	47,762	16
Forestry & Fish	85	1	—	—	—	—	67	—	7	—	2	—	465	—
Mining	1,352	17	3	—	216	3	192	1	56	2	—	—	2,791	1
Construction	514	7	109	8	605	8	2,371	8	130	6	142	12	17,464	6
Manufacturing	518	7	10	—	685	10	3,003	10	83	4	22	2	28,555	10
Transportation	370	5	79	6	352	5	2,228	8	155	7	79	6	18,005	6
Wholesale Trade	181	2	44	3	264	4	1,283	4	93	4	28	2	13,842	5
Retail Trade	1,503	19	191	13	1,263	18	6,229	21	343	15	209	17	51,384	17
Finance, Insurance, Real Estate	303	4	43	3	232	3	1,810	6	69	3	40	34	13,856	5
Services	2,339	30	283	20	2,291	32	9,105	31	381	17	296	24	85,476	28
Public Administration	309	4	184	13	340	5	1,928	7	61	3	159	13	17,049	6

Source: U.S. Department of Commerce PC 80—C43 Tables 69 and 178, 1983

counties, but it provides a major source of employment only in Custer County. Tourism and recreation are significant in Custer, Fall River, Lawrence, and Pennington counties. This is due to the tourism attraction of the Black Hills area.

Pennington County generates approximately half (45%) of the employment in the 13-county area. Rapid City, the largest city in the area, serves as the major trade center for the western portion of the region.

The major use of surface public lands is grazing. Due to the small percentage of public land in each county, Bureau actions generally do not have significant impacts on the economic structure of the counties (See Table 3-10.)

Agriculture

In the 13-county area, there are approximately 16.5 million acres of land. (See Table 3-13.) In 1982, approximately 5,200 farms/ranches utilized 83.5% of these lands. Cropland for production of corn, wheat and hay accounted for approximately 20% of the agricultural lands. Grazing land, which includes public grazing land, totalled approximately 77% of the agricultural lands. BLM-administered lands total approximately 279.5 thousand acres and support approximately 73,778 AUMs. The total market value from all agricultural production was approximately 302.6 million dollars in 1982 in the 13-county area (Department of Commerce, Bureau of Census).

TABLE 3-13
AGRICULTURAL ACREAGES AND MARKET VALUE OF PRODUCTION (1982)

Counties	Land Area	Farm Acres	No. of Farms	Market Value of Production
Brule	523,520	447,940	441	$23,264,000
Butte	1,440,000	1,120,970	494	26,691,000
Custer	996,480	418,046	302	7,885,000
Fall River	1,115,520	1,001,854	336	40,354,000
Haakon	1,162,240	1,208,121	322	25,364,000
Harding	1,716,480	1,584,596	274	16,235,000
Jackson	1,259,726	1,249,726	282	16,637,000
Lawrence	512,000	196,321	245	10,643,000
Lyman	1,077,120	907,934	422	28,690,000
Meade	2,217,600	2,056,225	773	33,761,000
Pennington	1,778,560	1,076,059	577	22,725,000
Perkins	1,830,400	1,670,908	595	27,858,000
Stanley	904,960	860,755	169	17,074,000
TOTALS	16,534,606	13,799,455	5,232	$296,445,000

Source: U.S. Department of Commerce, Bureau of Census, 1982 Census of Agriculture, February 1984.

In 1982, the 13-county area had a cattle and calf inventory of approximately 800,000. This was 20.3% of the total state inventory. Sales of cattle and calves totalled approximately 469 thousand head and this was approximately 19.4% of the state's total sales.

Assuming BLM-administered lands are used on the average of 8 months a year, the 73,778 AUMs produce 9,222 animal units, which is 2.1% of the cattle and calf sales for the 13-county area. Assuming $400 of gross revenue per animal unit, production on public lands contributes $3,688,800 of gross revenue annually to the livestock industry. Approximately $10/AUM of ranch income, a net term, is associated with the BLM AUMs. That is, approximately three quarter million dollars of ranch income is associated with BLM AUMs.

Public land is an economic factor to the 444 ranches that have allotments on BLM-administered lands and enables many of them to remain in business.

The average ranch is 9.9% dependent upon public land to support the ranch operations. (See Table 3-14.) Generally, the smaller ranches are more dependent on BLM lands than are the larger ones.

Permit Value

The BLM does not recognize the right of the operator to treat his BLM grazing preference as real property; however, these preferenced AUMs do have value. The value of the preference varies considerably. If the preference is for small, isolated, landlocked tracts of public lands, the value is minor. Where public lands provide a large block of grazing, the preference value can be substantial. Preference value is difficult to estimate because it usually is not separated from the total value of the ranch. Ranches are usually valued and sold on a cost-unit basis. It is estimated that an average value for the BLM grazing preference is approximately $100 per AUM or $1,200 per animal unit.

TABLE 3-14
ESTIMATED RANCH DEPENDENCY ON BLM LAND

Ranch Size Category	Ranches in Category	Number of Ranches in Each Category of Dependency				Average Percent Dependency
		0-15	16-30	31-45	45-100	
Small 0-3,500 acres	183	118(64%)	25(14%)	5(3%)	35(19%)	11.6%
Medium 3,501-9,000 acres	169	146(86%)	19(86%)	3(2%)	1(1%)	8.7%
Large 9,001-14,000 acres	47	39(83%)	5(11%)	2(4%)	1(2%)	9.0%
Very Large 14,001 and up	45	33(73%)	9(20%)	0(0%)	3(7%)	10.2%
	444	336(76%)	58(13%)	10(2%)	40(9%)	9.9%

Source: BLM 1984

SOCIAL CONDITIONS

Population Trends

Since 1870 South Dakota has had sizeable population increases every decade until the drought and depression years of the 1930's. The most rapid growth occurred during the 1870 to 1880 settlement years of Dakota Territory. (See Table 3-15.) Drought in the 1880's discouraged settlement and encouraged many to move after 1890. There was a new surge of growth after 1900. This growth was generated by the opening of western South Dakota to homesteaders, the coming of railroads, and the establishment of trade centers. These factors combined gave South Dakota its largest population ever in 1930, 692,849 persons.

TABLE 3-15

TOTAL POPULATION OF SOUTH DAKOTA, URBAN AND RURAL BY DECADE, 1880 — 1980

	Population of South Dakota		
	The State	Urban	Rural
1880	98,268	7,208	91,060
1890	348,600	28,555	320,045
1900	401,570	40,936	360,634
1910	583,888	76,469	507,419
1920	636,547	101,872	534,675
1930	692,849	130,907	561,942
1940	642,961	158,087	484,874
1950	652,740	216,710	436,030
1960	680,514	267,180	413,334
1970	666,257	296,628	369,629
1980	690,768	320,777	369,991

Source: U.S. Department of Commerce, Bureau of Census, 1980 Census of Population, Number of Inhabitants, South Dakota

During the period of 1930 to 1940, South Dakota's population decreased by almost 50,000 persons. Drought and unemployment forced many to seek employment elsewhere. From 1940 to 1950, South Dakota experienced small increases in population.

Recent trends (1970 to 1980) show eight out of 13 counties increasing in population. Population decreases are shown in five entirely rural counties, Brule, Haakon, Harding, Lyman and Perkins (Tables 3-16 and 3-17). Distributed age classes within the 13 counties are not significantly different from the statewide percentages. Over half of the population is in the working age group, 18 to 64 years. Less than one third of the population is under 17 years and around one sixth is 65 years and older.

Historically, the industrial base of the Resource Area has been dominated by agriculture, which has largely determined the shape of both the economic and social structure of the area. The prevailing lifestyle is strongly tied to the land and to the sense of independence, self-reliance and stability which is characteristic of rural areas. In 1930, the state's largest population was rural, accounting for 81 percent of the total. (See Table 3-18.) This figure continued to decline with the rural percentage being 53.6 percent statewide in 1980. Some counties show the entire population as being rural, outside communities of 2,500 in population. Pennington County shows the smallest percentage being rural at 23.2 percent. Pennington County includes Rapid City, the major population center in the Resource Area.

TABLE 3-16

POPULATION CHARACTERISTICS AND SOCIAL WELL-BEING BY COUNTY

		Brule	Butte	Custer	Fall River	Haakon	Harding	Jackson
Population 1970	1)	5,870	7,825	4,698	7,505	2,802	1,855	2,920 A
Population 1980	2)	5,245	8,372	6,000	8,439	2,794	1,700	3,437
Percent change (1970—1980)	2)	-10.6%	7.0%	27.7%	12.4%	-0.3%	-8.4%	+17.7%
Density 1980 (per square mile)	1)	6.4	3.7	3.8	4.9	1.5	0.6	1.8
Percent population by age (1980)	2) 1)							
— 17 yrs or less		31.4%	30.3%	29.7%	27.5%	34.3%	30.5%	39.2%
— 18 to 64 yrs		54.0%	55.5%	58.5%	55.3%	52.8%	56.4%	50.2%
— 65 yrs or more		14.5%	14.2%	11.8%	17.2%	12.8%	13.1%	10.6%
Percent nonwhite population (1980)	3)	2.4%	2.5%	3.3%	6.2%	1.5%	1.3%	43.7%
Unemployment rate (July 1984)	4)	3.8	3.1	2.2	2.9	1.4	1.5	2.7
Median Income of families (1979)	5)	13,037	15,345	16,798	14,274	14,131	14,301	13,783
Percent families below poverty level (1979)	5)	21.4	12.7	10.2	12.5	18.4	19.1	27.4

		Lawrence	Lyman	Meade	Pennington	Perkins	Stanley	South Dakota
Population 1970	1)	17,453	4,060	17,020	59,349	4,769	2,457	666,257
Population 1980	2)	18,339	3,864	20,717	70,361	4,700	2,533	690,768
Percent change (1970—1980)	2)	5.1%	-4.8%	21.7%	18.6%	-1.4%	3.1%	3.7%
Density 1980 (per square mile)	1)	22.9	2.3	6.0	25.3	1.6	1.8	9.1
Percent population by age (1980)	2) 1)							
— 17 yrs or less		27.3%	35.4%	33.3%	30.0%	28.2%	34.1%	29.8%
— 18 to 64 yrs		59.6%	52.5%	58.5%	61.6%	56.7%	56.1%	57.1%
— 65 yrs or more		13.1%	12.1%	8.2%	8.4%	15.1%	9.9%	13.2%
Percent nonwhite population (1980)	3)	2.5%	23.4%	5.5%	7.9%	1.2%	3.9%	7.4%
Unemployment rate (July 1984)	4)	3.8	4.9	3.0	3.6	2.0	3.5	3.8
Median Income of families (1979)	5)	16,597	12,863	16,624	17,364	15,049	16,996	13,830
Percent families below poverty level (1979)	5)	10.3	24.8	8.0	9.5	15.9	11.2	13.1

A. The population figures for Jackson County in 1970 did not include Washabaugh County. However, the 1980 census reflects the combined population of both counties because they consolidated. To obtain a realistic percentage of change the 1970 population of Jackson County has the 1970 population of Washabaugh County added to it.

1) U.S. Department of Commerce, Bureau of Census, 1980 Census of the Population, A Number of Inhabitants, South Dakota.

2) U.S. Department of Commerce, Bureau of Census, 1982, 1980 Census of the Population, General Population Characteristics, South Dakota.

3) U.S. Department of Commerce, Bureau of Census, 1982, 1980 Census of Housing, General Housing Characteristics, South Dakota.

4) South Dakota, Department of Labor, 1984, South Dakota Labor Bulletin, July.

5) South Dakota, Department of Health, 1982, South Dakota Vital Statistics and Health Statistics.

6) U.S. Department of Commerce, Bureau of Census, 1982, 1980 Census of the Population, General Social and Economic Characteristics, South Dakota.

TABLE 3-17

CHARACTERISTICS OF RURAL AND FARM POPULATION

	Brule	Butte	Custer	Fall River	Haakon	Harding	Jackson
Percent Rural (population below 2,500) (1980) 1)	100%	44.0%	100%	43.5%	100%	100%	100%
Percent Farm (based on total population) (1980) 2)	26.4%	13.2%	10.6%	5.6%	31.6%	51.0%	26.6%
Percent Change in Total Acreages for Farms and Ranches (1974-1978) 3)	-9.7%	-10.7%	10.2%	-7.6%	5.8%	4.4%	-3.6%
Percent Change in Number of Farms and Ranches (1974-1978) 3)	-5.6%	-0.4%	2.2%	-5.0%	2.3%	-11.5%	-9.4%
Percent Change in Averrage Size of Farms and Ranches (1974-1978) 3)	-4.3%	-10.3%	7.8%	-2.8%	3.5%	17.9%	6.4%

	Lawrence	Lyman	Meade	Pennington	Perkins	Stanley	South Dakota
Percent Rural (population below 2,500) (1980) 1)	47.8%	100%	52.0%	23.2%	100%	100%	50.6%
Percent Farm (based on total population) (1980) 2)	2.6%	25.6%	8.4%	1.7%	35.6%	20.8%	16.9%
Percent Change in Total Acreages for Farms and Ranches (1974-1978) 3)	3.0%	-3.3%	7.2%	-16.9%	-6.6%	-9.0%	-3.1%
Percent Change in Number of Farms and Ranches (1974-1978) 3)	3.2%	11.2%	-9.9%	-5.2%	-9.7%	-5.3%	-7.4%
Percent Change in Averrage Size of Farms and Ranches (1974-1978) 3)	-0.2%	8.9%	3.0%	-12.4%	3.4%	-3.8%	4.6%

1) U.S. Department of Commerce, Bureau of Census, 1980 Census of Population, Number of Inhabitants, South Dakota

2) U.S. Department of Commerce, Bureau of Census, 1980 Census of Population and Housing, Summary Tape File 3A, South Dakota.

3) U.S. Department of Commerce, Bureau of Census, 1978 Census of Agriculture, State and County Data, South Dakota.

TABLE 3-18

SOUTH DAKOTA'S URBAN AND RURAL POPULATION AS A PERCENT OF STATE POPULATION, 1880 - 1980

					Year						
	1800	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980
Rural	92.7	91.8	89.8	86.9	84.0	81.1	75.4	66.8	60.9	55.5	53.6
Urban	7.3	8.2	10.2	13.1	16.0	18.9	24.6	33.2	39.1	44.5	46.4

Source: U.S. Department of Commerce, Bureau of Census, 1980 Census of Population, Number of Inhabitants, South Dakota.

4

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter provides a more detailed discussion of the identified environmental consequences of implementing each alternative. Unless otherwise indicated, the impacts identified are in relationship to the present. A summary of impacts by resource is found at the end of Chapter 2. Climate and topography discussed at the beginning of Chapter 3, Affected Environment were not analyzed further since these components would not be significantly affected by any of the alternatives. There are resources for which environmental consequences would be common to all alternatives. These consequences are discussed in this introduction to avoid unnecessary repetition.

Cultural Resources

Improved range condition would generally benefit cultural resource sites by increasing ground cover and reducing erosion. Prior to ground disturbing operations, lands identified for improvement would be inventoried for prehistoric sites. Mitigation through existing policies would minimize the impacts of ground-disturbing treatments on cultural resource values.

The lands that are identified for potential sale, exchange or other disposal action, would be inventoried for prehistoric and historic sites. Through existing policies for mitigation, the effects on cultural resource values would be minimal. Through exchanges, cultural resource values could be gained.

For the potential 65,000-acre exchange project with the State of South Dakota, the BLM is negotiating a Memorandum of Understanding with the State Historic Preservation Officer and the Advisory Council on Historic Preservation, whereby the State of South Dakota has agreed to accept responsibility to protect properties which may be eligible for the National Register.

Land use changes through R&PP actions would have insignificant impacts on cultural resources, due to the small acreages involved.

Summary

The impacts of all actions on cultural resources would be insignificant. Any site which is inadvertently destroyed would be irreversibly and irretrievably destroyed.

Forestry

There would be no impacts to the forest resource from any of the vegetation apportionment actions.

If there resulted a net reduction of forest land from public ownership due to sales or exchanges, the adverse impacts would be minimal. A reduction in forest land available for incidental sales of forest products would be insignificant. This loss of forest product sales would have no significant impact on the Bureau's forestry program, or on local availability of forest products. Land use changes through R&PP actions would have an insignificant impact on the forestry resource, due to the small acreages involved.

Summary

There would be no impacts from vegetation apportionment and insignificant impacts from lands actions. There would be no irreversible or irretrievable loss of the forest resource.

Paleontologic Resources

Paleontologic resources would not be significantly affected by vegetation apportionment actions. Some trampling of significant localities by livestock may occur. Avoidance or collection of paleontologic material when constructing range projects would occur on a case-by-case basis. Special emphasis would be placed on projects located in the Morrison formation, Lakota sandstone, Hell Creek formation and White River group to avoid damage to significant localities.

The lands currently proposed for disposal have not been identified as to whether they fall within one of the geologic formations considered significant for paleontologic resources. However, mitigation through existing policies would minimize the impacts of ground-disturbing treatments on paleontologic values. Land use changes through R&PP actions would have insignificant impacts on paleontological resources, due to the small acreages involved.

Summary

There would be insignificant impacts on paleontology from vegetation apportionment and lands actions. Any site inadvertently destroyed would be irreversibly and irretrievably destroyed.

Recreation

The 120 additional water sources over the long term would improve hunting potential through the dispersion and possible increase of wildlife and would increase the fishing resource. The 30 miles of fence proposed over the long term would inconvenience hunters by restricting their movements, although this would be an insignificant impact. Mechanical treatment would result in localized temporary reductions in hunting habitat, which would be an insignificant impact in the long term. Recreation, especially hunting and wildlife observation, would benefit if special management was given to riparian areas. There would be no significant effects on visual resources.

The sale of acreage over the long term would result in an insignificant impact to recreational opportunities. The lands identified for disposal are generally isolated from the public due to lack of access. The exchange of acreage over the long term would allow public land to be consolidated and possibly gain access to isolated tracts. Increased access to public lands would aid the BLM in meeting the long-term demand for recreation. Therefore, the exchanges would have significant beneficial impacts. Land use changes through R&PP actions would have insignificant impacts on the recreation resource, due to the small acreages involved.

Summary

There would be insignificant impacts on recreation from vegetation apportionment actions. The sale of lands at the current rate would insignificantly affect recreation, but exchanges would have a moderately significant beneficial impact. There would be no irreversible or irretrievable loss of the recreational resource.

Minerals

There would be no impacts on minerals from vegetation apportionment actions.

Disposal of the federal surface estate over reserved leasable minerals would have the impacts of: (1) reducing the BLM workload of checking reclamation from exploration, and (2) complicating the permitting process for the lessee, since an additional participant (the surface owner) besides BLM would be involved. These impacts would not be significant.

There would be no impacts on claimed locatable minerals, since lands with mining claims recorded under Section 314 of FLPMA may not be exchanged or sold. Disposal of the surface estate would prevent unclaimed locatable minerals from being claimed and recorded, pending regulations issued by the Secretary of the Interior. The resulting impacts would not affect BLM, since the federal government receives no royalties from locatable minerals, but impacts would occur to private mining parties who lose access to potential mineral resources. This could involve some of the acres identified for sale and exchange annually, but this would be an insignificant impact.

Disposal of the surface estate would not affect BLM ownership of underlying mineral materials. A 1983 U.S. Supreme Court decision affirmed public ownership of sand and gravel on lands where the surface only was patented. Mineral entry rights would be preserved.

Land use changes through R&PP actions would have insignificant impacts on the minerals resource, due to the small acreages involved.

Summary

There would be no impacts from vegetation apportionment actions and impacts from land actions would be insignificant. There would be an irreversible and irretrievable loss of the mineral resource to the extent that non renewable resources are developed.

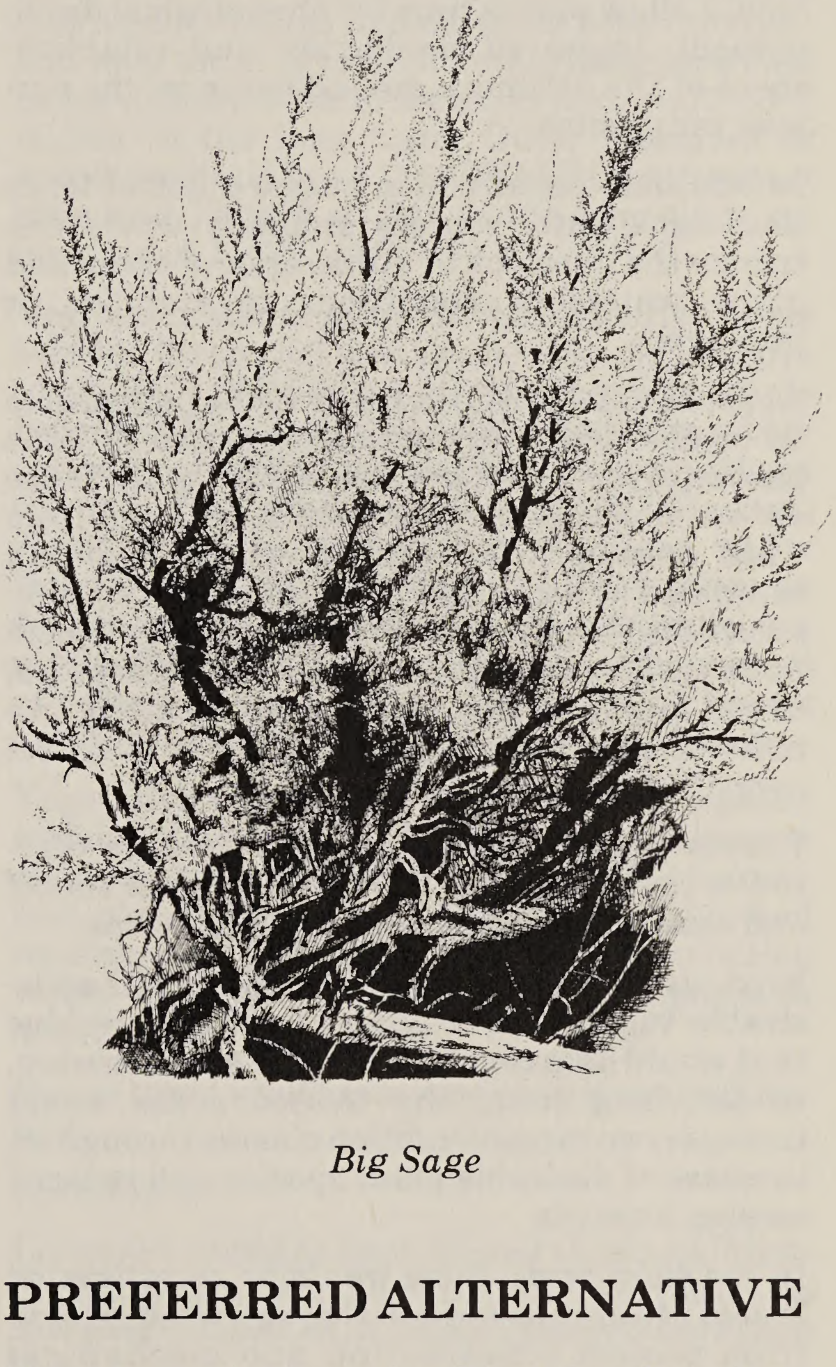
Social Conditions

Any improvements in the range conditions would beneficially impact ranch income, which in turn, would have a positive effect on the social well-being of families dependent on these lands. The social well-being of small livestock operators has the greatest potential for positive impacts, since some of these people are currently earning a minimum income and any change could have an effect on their standard of living.

There would be potential for both increasing and lowering the social well-being of ranchers who use BLM lands for grazing in both sales and exchanges.

Sale as a method of land disposal may have more potential for negative impacts. If land adjacent to current operators is sold, the operator may not be able to afford to purchase the land.

Exchange as a land disposal practice may have less likelihood of inequitable impacts. There is still the possibility that if land adjacent to current operators is exchanged to someone else, it may harm the operator's ranching operation. If exchanges are used to improve access to public land or to acquire prime recreational land, regional recreational and hunting opportunities would be enhanced.



Big Sage

PREFERRED ALTERNATIVE

This alternative is a mix of the other four alternatives. It provides for resource management which best resolves the planning issues and criteria.

Soils

This alternative would result in 31,783 acres of fair condition range improving to good or better watershed condition in the long term through grazing management. The quickest improvement in the watershed to good or better condition would result on seven allotments which would receive deferments of livestock use on 6,082 acres of fragile soils during the wet spring season, and for which livestock use would be excluded on 1,331 acres of manageable riparian areas. As a result of an adjustment in livestock use during the wet season of the year and livestock exclusion on riparian areas, there would be a reduction of soil trampling, compaction, streambank sloughing, and an increase in vegetative ground cover. Use adjustments would allow plants time for phenological development, improved production and establishment of the optimum ground cover on the various range sites.

In addition, construction of two miles of fence and eight water sources annually would distribute the livestock to utilize upland areas and allow watershed conditions to stabilize or improve.

Approximately 9,035 acres have the potential to be mechanically treated or converted to tame pasture over the long term, which would cause an estimated loss of 228 acre feet of soil from wind erosion. Wind erosion would cause an estimated .6 acre feet of soil loss from the construction of eight water sources annually (9 acre feet over 15 years) and an estimated .5 acre feet of soil loss from livestock trampling along two miles of new fence lines annually (8 acre feet over 15 years).

Prairie dog management would increase vegetative cover in the long term and reduce runoff and erosion in managed prairie dog towns.

Noxious weed control would initially kill undesirable vegetation, leaving dead plant residue that would help control wind and water erosion. In the long term, the treated areas would increase two range condition classes through an increase of desirable plant species and reduced erosion hazards.

In the short term, there would be an estimated loss of 245 acre feet of soil through wind erosion from project construction and mechanical treatment. In the long term, with proper mitigation, there would be no significant losses of soil.

The sale of 300 acres annually would not impact the soils resource except where there may be a change in land use or type. The type of change made, i.e., agriculture and road or construction activity and the area's erosion hazard, would determine the amount of impact on adjacent public soils and watershed. This is expected to be an insignificant loss.

The exchange of 1,000 acres annually and the potential for a 65,000-acre exchange project over the long term, would not impact the soils or watershed resource. However, newly consolidated areas the BLM may receive through exchange actions may be in such vegetational or erosion condition to require an activity plan to improve the affected watershed.

Land use change through R&PP actions would have insignificant impacts on the soils resource, due to the small acreages involved.

Summary

Impacts to the soils resource from vegetation apportionment actions except for fragile soils and riparian areas would be insignificant. Soils resource conditions would be improved significantly on fragile soils and riparian areas. Lands actions would have no impacts on the soils resource. The impacts to the soils resource would be irretrievable but not irreversible.

Hydrology

Grazing systems and range improvement projects would improve fair condition lands in all I and M category allotments to good or better range condition. Generally, an improvement in range condition implies an improvement in watershed condition. Assuming this holds true, accelerated erosion and sedimentation would be reduced to closely match rates of natural geologic erosion.

Seasonal deferments during the wet spring season on 6,802 acres of fragile soils, fencing and proper placement of new water sources would encourage better livestock distribution. Adjustments in livestock use on fragile soils and livestock exclusion on 1,331 acres of riparian areas on seven allotments would allow increased plant density, vigor and root development and less soil compaction, especially around water sources and other areas where livestock tend to concentrate. Areas that do not respond to grazing management may be mechanically treated or converted to tame pasture resulting in increased plant cover and reduced erosion and sedimentation (Wight and Sidoway 1972; Ryerson et al 1980; Saulman 1973; Neff and Wight 1977; Neff 1980). Water quality would be improved as sedimentation is reduced. Reservoir life and efficiency would be increased.

Fencing of riparian areas on 1,331 acres would result in less streambank erosion and improved water quality (Holcheck 1980). Fencing of water sources because of wildlife values would also result in improved water quality.

Concentrations of noxious weeds and prairie dog towns force livestock to graze noninfested areas. Treating these areas would result in better livestock distribution and a slight improvement in erosion, sedimentation and water quality.

Approximately 300 acres would be proposed for sale annually. Since these lands would be scattered small parcels, the sale would have no significant impact on water resources. The 1,000 acres proposed for exchange annually and the potential for a 65,000-acre exchange action over the long term could have positive impacts on the water resources. Lands gained would consolidate public land and in many cases would allow BLM to control the major portion of watershed. In accordance with vegetation apportionment actions of this alternative, the acquired lands would be upgraded to good or better range condition. Erosion and sedimentation would be reduced to near natural geologic erosion rates. Land use changes through R&PP actions would have insignificant impacts on the water resource, due to the small acreages involved.

Summary

Erosion and sedimentation would decrease as range condition improves. Soil losses would be irretrievable but not irreversible. Reduction of accelerated sediment yields, except for fragile soils and riparian areas, would be insignificant relative to total sediment yields. The reduced sediment yields for the fragile soils and riparian areas would be significant. Lands sales would not impact water resources. Land exchanges would have insignificant impacts on the water resources.

Range

Vegetation

The apportionment of vegetation would be 28 percent to livestock and 72 percent to watershed and wildlife forage and cover, in both the short and long term. Livestock authorizations would be for 45,305 AUMs in the short term and 50,367 AUMs in the long term. Other resources or activities would have 116,103 AUMs in the short term and 127,808 AUMs in the long term, an increase of 11,705 AUMs.

Vegetation communities in those riparian areas selected for special management would improve to climax condition and level off and stagnate because of the exclusion of livestock use. Other ranges in good to excellent condition would not change. Fair condition ranges (31,783 acres) would improve to good or excellent under intense grazing management. Vegetation on fragile soils would increase in condition (vigor, productivity, diversity, ground cover) as a result of deferred grazing. Response would be fastest on the selected riparian and fragile soil areas.

Vegetation communities now in fair condition which did not respond to grazing management would improve dramatically (a one or two condition class change) as a result of mechanical treatment on 1,663 acres. Vegetation production would increase several fold on tame pastures developed on 7,372 acres.

Range trend would continue in an upward direction.

Livestock

Livestock would be apportioned 45,305 AUMs in the short term and 50,367 in the long term, an increase of 5,062 AUMs above the present situation.

Allotments could move from M and C categories to the I category if significant resource problems were identified by an activity. Conversely, as resource problems are resolved, I allotments could move to M or C categories.

Management intensity would continue at its current level in the short term (four BLM administered AMPs). More intense management would be required to resolve resource problems which may occur, to improve range conditions, or to provide rest and deferment for mechanically treated areas.

Exclusion of livestock from riparian areas and deferment of grazing on fragile soils on seven allotments during the wet spring season would cause increased use of other lands to replace lost forage or changed seasons. Other impacts could be a reduction of herd sizes or development of tame pasture. Production estimates are lower than grazing preference on 21 allotments and higher on 31. No preference change would occur on 16 allotments.

Intensive management would be required on 52 allotments to provide forage by improved range condition, mechanical treatment, tame pasture development, and to offset loss of riparian and fragile area grazing. A short-term loss of forage would occur on lands converted to tame pasture or mechanically treated.

Some range improvements would be required, in addition to the two miles of fence and eight water sources discussed in other alternatives, to fence riparian areas and to replace water sources lost by exclusion from riparian and fragile soil areas.

There would be an average loss of approximately 82 AUMs annually from land sales. The sale of these tracts would result in reduced grazing administrative costs.

Land use changes through R&PP actions would have no significant impacts on the range resource, due to the small acreages involved.

A similar amount of vegetation production may be gained from exchanges and no significant losses of AUMs should occur.

Summary

There is significant improvement in trend and condition of the range resource due to vegetation apportionment actions. Vegetation condition on riparian areas selected for special management would improve significantly because livestock would be excluded. Increases of 5,062 livestock AUMs would be significant. Impacts to operators would be both positive and negative but generally insignificant. Thirty-one allotments would receive livestock increases and 21 allotments would experience reductions in the long term. Intensive management would be required on 52 allotments. Land sales and exchanges would have insignificant impacts on the range resource. There would be no irretrievable or irreversible loss to the range resource.

Wildlife

Vegetation apportionment for watershed and wildlife forage and cover of 116,103 AUMs in the short term and 127,808 AUMs in the long term, an increase of 11,705 AUMs, would be very beneficial to wildlife by providing additional forage.

Fencing the manageable riparian areas (1,331 acres) on seven allotments and construction of new range improvements away from these areas would improve the condition and age class diversity of the woody vegetation. This would result in an increase in residual vegetation available as food and cover for wildlife. An adjustment of livestock use on the seven allotments during the wet spring season would improve the quality and quantity of forage, especially forbs.

Mechanical treatment of 1,663 acres and tame pasture development of up to 7,372 acres on M and I allotments would have slight negative impacts on wildlife habitat in the short term. But the effect on wildlife habitat would be beneficial in the long term. Vegetation manipulation would alter the wildlife population density and diversity in the treated areas, temporarily displacing wildlife. But the increase in succulent spring grass and forbs would benefit some species seasonally. However, decreased vegetative diversity in areas converted to tame pasture could reduce the abundance and diversity of some wildlife species.

Range improvements of two miles of fence and eight water sources developed annually would displace wildlife temporarily due to habitat disruption and increased human activity. However, the additional water sources would be beneficial to wildlife. They would disperse heavy concentrations of livestock at watering sites and would provide additional water sources for wildlife.

Improving trend and range condition would result in improved wildlife habitat over the long term.

The fencing of selected water sources because of wildlife values would protect the residual vegetation around these water sources, increasing the amount of residual vegetation available as food and cover for all wildlife species. Fencing would also improve the water quality of these water sources for fisheries habitat. Construction of islands in selected water sources would provide additional habitat for waterfowl.

Allotments having intensive grazing management applications would be beneficial to wildlife because the quality and quantity of forage would be enhanced.

The sale of 300 acres and exchange of 1,000 acres annually and the potential for a 65,000-acre exchange project over the long term, would mean the change of administration on that wildlife habitat. The potential exists to exchange lands having equal or greater wildlife habitat values, which would benefit from public ownership. The public lands considered for disposal through sales could have insignificant negative impacts on the wildlife habitat resource if the lands were converted to uses incompatible with wildlife. Land use changes through R&PP actions would have insignificant impacts on the wildlife resource, due to the small acreages involved.

Summary

Over the long term, improved range conditions and most developments would have significant beneficial impacts on wildlife. In the short term, some mechanical treatments could displace wildlife, temporarily, resulting in an insignificant impact. There would be insignificant impacts on wildlife due to lands actions. There would be no irretrievable or irreversible loss of the wildlife resource.

Lands

There would be no impacts on the lands resource resulting from vegetation apportionment.

Sales of scattered and isolated tracts would result in a loss of 300 acres annually from public ownership. Most of these lands are small, scattered, isolated tracts unusable by the public and inefficient to manage as part of the public land system.

Exchanges of 1,000 acres annually and the potential for a 65,000-acre exchange project over the long term, would result in a moderate increase in management efficiency and public use by consolidating scattered and isolated tracts and providing access to tracts of public land. Disposal under the R&PP action would result in no significant impacts on the lands resource, due to the small acreages involved. Disposal actions (sales and exchanges) within the retention zone would be considered on their own merits. (See South Dakota Resource Area Map in map pocket.)

Summary

There would be no impacts from vegetation apportionment. The impacts of sales on the reductions in the public land resource and the increases in management efficiency are insignificant. Exchanges would result in significant beneficial impacts on the public land resource and management efficiency. There would be no irreversible or irretrievable loss to the lands resource.

Economics

This alternative would show an increase from the present of 5,062 AUMs for livestock over the long term at an additional cost of $217,560. This is approximately $43 per livestock AUM gained if implemented over the 15-year period. Assuming an 8-month use of BLM lands, 633 additional animal units would be supported. Assuming $400 per animal unit, $253,100 additional annual gross income or approximately $50,000 in ranch income could be provided to ranchers. Over the long term, a total of 21 operations may receive reductions of AUMs and 28 operations may receive increases. Of the 21 operations with reductions in total AUMs, only two operations have reductions greater than 10 percent. Of the 28 operations with increases, 17 operations have increases greater than 10 percent. (See Appendices B, C and K.)

Sales of 300 acres per year would result in counties losing Payment in Lieu of Taxes (PILT) payments on these federal acres. However, this revenue loss to counties would be replaced by increased property tax revenues.

The effect of exchanges differs depending on whether fee land or state land is involved. If an exchange occurs between BLM and a fee owner within one county, the county revenues from PILT and taxes would not change. If the exchange involves more than one county, the combination of PILT and county tax revenues for any one county could change. However, on a per acre basis, PILT and county revenues are similar. Thus, the net effect of the combined county tax and PILT revenues for each county would be insignificant. The situation is different for exchanges between the State of South Dakota and BLM, because state lands acquired by the BLM are not eligible for PILT. The impacts to state revenues would remain unchanged because the total state-owned acreage would remain constant.

Ranchers at present are paying $6.03 per AUM (1984) to the State of South Dakota and are also making payments comparable to taxes to the counties for those lands grazed. In comparison, ranchers at present are paying $1.37 per AUM (1984) for grazing on federal acres, and no taxes on these lands go to the county. Consequently, ranchers who are grazing on state lands can expect to pay a lesser fee when ownership of the acreage becomes federal, and those ranchers who are grazing on federal land would pay more after the lands are exchanged to the state. Land use changes though R&PP actions would have insignificant economic impacts, due to the small acreages involved.

Summary

Two operations may have decreases in total AUMs and 17 may have increases that are significant (greater than 10 percent). There would be no significant impacts from sale or exchange between BLM and fee owners. Exchanges between the BLM and the State could cause significant impacts on county PILT revenues and operations whose state grazing acreage increases.

June Grass

ALTERNATIVE A

This alternative is a continuation of present management.

Soils

This alternative would maintain the existing watershed condition which occurs because of ongoing grazing treatments in the short term and would result in 31,783 acres of fair condition range improving to good or better condition in the long term through grazing management. Management of livestock which would distribute grazing away from critical areas such as flood plains and reservoirs, would improve watershed condition in the long term. These areas are subject to trampling and compaction, which reduces vegetation and increases runoff and erosion.

Replacement or maintenance of range improvements would maintain the current distribution of livestock on upland areas and allow watershed conditions to improve.

Wind erosion would cause an estimated .6 acre feet of soil loss from the replacement or maintenance of eight water sources annually (9 feet over 15 years).

Prairie dog management would increase vegetative cover in the long term and reduce runoff and erosion in managed prairie dog towns.

Noxious weed control would initially kill undesirable vegetation, leaving dead plant residue that would help control wind and water erosion. In the long term, the treated areas would increase two range condition classes through an increase of desirable plant species and reduced erosion hazards.

In the short term, there would be a disturbance loss of 9 acre feet of soil through wind erosion from project construction and mechanical treatment. In the long term, with proper mitigation, there would be no significant loss of soil.

The sale of 200 acres annually would not impact the soils resource except where there may be a change in land use or type. The type of change made, i.e., agriculture and road construction activity with the area's erosion hazard, would determine the amount of impact on adjacent public soils and watershed. Actual impacts would be covered on a case-by-case basis. This is expected to be an insignificant loss.

The exchange of 1,000 acres annually would not impact the soils or watershed resource. However, newly consolidated areas the BLM may receive through exchange actions may be in such vegetational or erosion condition to require the need for an activity plan to improve the affected watershed.

Land use change through R&PP actions would have insignificant impacts on the soils resource due to the small acreages involved.

Summary

Impacts to the soils resource from vegetation apportionment and land actions would be insignificant. The impacts to the soils resource would be irretrievable but not irreversible.

Hydrology

Fair condition range on I and M category allotments would improve to good or better range condition. Generally, an improvement in range condition results in an improvement in watershed condition. Assuming this holds true, accelerated erosion and sedimentation would be slowed to more closely resemble natural geologic erosion.

Riparian areas would continue to receive continuous heavy use by livestock especially during the summer months. Streambank erosion and degradated water quality would slowly increase in the long term.

Concentrations of noxious weeds and prairie dog towns force livestock to graze noninfested areas. Treatment of these areas would result in better livestock distribution and a slight improvement in erosion, sedimentation and water quality.

No significant impacts to water resources would result from the sale of 200 acres, or the exchange of 1,000 acres identified for disposal or R&PP actions.

Summary

The trend for watershed condition on public lands would be upward as fair condition lands improve to good or better condition. Sediment loss would be irretrievable but not irreversible. Reduction of accelerated sediment yield would be insignificant relative to total sediment yields. Lands actions would have no significant impacts on water resources.

Range

Vegetation

Apportionment of vegetation would be 28 percent (45,305 AUMs) to livestock and 72 percent (116,103 AUMs) to watershed and wildlife forage and cover, in the short term, and 26 percent (45,305 AUMs) and 74 percent (128,287 AUMs), respectively, in the long term.

The percentage of rangeland in good to excellent condition would increase with management by this alternative. No additional AUMs would be allocated to livestock in the long term. These changes would occur on M and I category allotments.

The trend of public rangelands would slowly continue to be improved under management by this alternative. There would be no change on C category allotments. Trend specifics are shown in Table 3-10.

Vegetation production resulting from the application of this alternative would increase by 17 percent because of improving range condition and trend, as discussed above, on 31,783 acres through grazing management in the long term. All increased vegetation would be apportioned to resources other than livestock.

Prairie dog management would have an immediate effect of improving vegetative production and range condition. Production would increase because of improved plant vigor and the transition of the plant community from low to high producing species. Increased vegetation shade and litter would increase site moisture retention and improve plant growth conditions.

Control of noxious weeds would result in an increase of desirable plant species, range condition, species diversity and useful vegetation production.

Livestock

Livestock would be apportioned 28 percent of the vegetation production in the short term and 26 percent in the long term. The categorization of allotments would continue under this alternative. (See Table 3-11.)

Allotments could move from M and C categories to the I category if significant resource problems were identified by any activity. Conversely, as resource problems are resolved, I allotments could move to M or C categories.

Management intensity would continue at its current level in the short term (four BLM administrative AMPs). More intense management would be required to resolve resource problems which may occur, to improve range conditions, or to provide rest and deferment.

The development of two miles of fence and eight water sources annually would reduce available forage very little but would improve the overall condition of the allotments by providing for more even distribution and utilization.

There would be an average loss of approximately 49 AUMs annually from land sales. The sale of these tracts would result in reduced grazing administrative costs.

A similar amount of vegetation production may be gained from exchanges and insignificant losses of AUMs should occur. Exchanges which consolidate tracts of public land could result in more efficient grazing management.

Land use changes through R&PP actions would have no significant impact on the range resource, due to the small acreages involved.

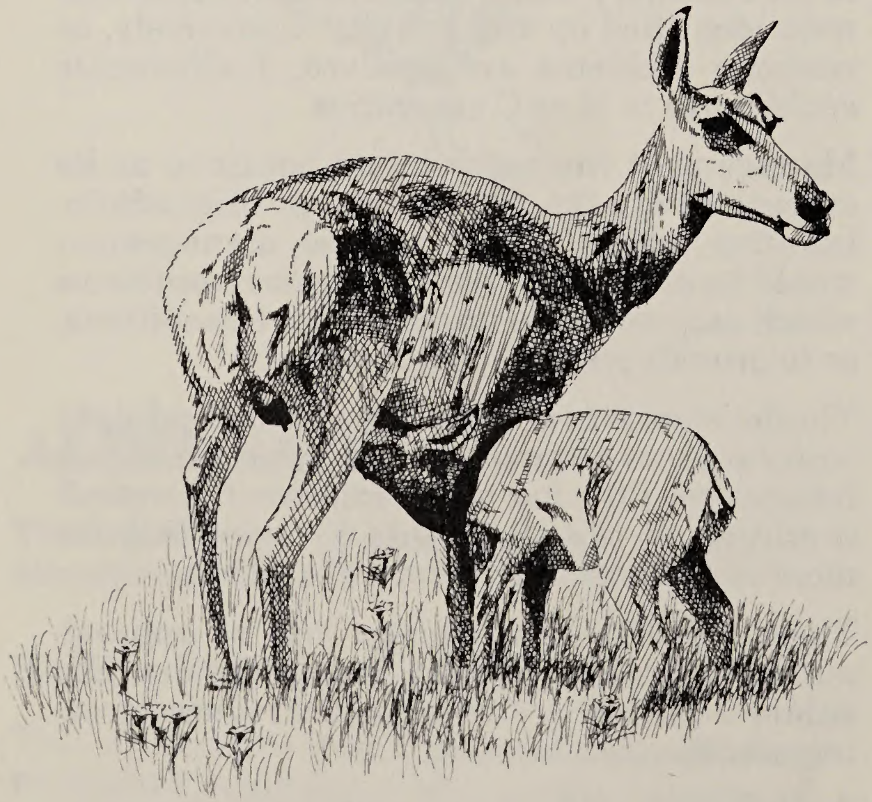
Summary

There is a significant improvement in trend and condition of the range resource due to vegetation apportionment actions. There would be no change of AUMs in any allotments. Land sales and exchanges would have insignificant impacts on the range resource. There would be no irreversible or irretrievable loss of the range resource.

Wildlife

Vegetation apportionment for watershed and wildlife forage and cover of 116,103 AUMs in the short term and 127,808 AUMs in the long term on the M and I allotments, an increase of 12,184 AUMs, would have favorable impacts on wildlife by providing additional forage. Little change in wildlife numbers other than natural fluctuations would be expected.

Riparian areas with historically heavy use by livestock would continue to see little or no reproduction of the woody species. Condition as well as age class diversity would be reduced. Eventually some riparian areas may be lost.



Range improvements of two miles of fence and eight water sources developed or replaced annually, would displace wildlife temporarily, due to habitat disruption and increased human activity. However, the replacement or development of these water sources would be beneficial to wildlife by breaking up heavy concentrations of livestock at overused watering sites and by providing additional water sources for wildlife.

The replacement of water sources would be beneficial to wildlife. Because no water sources would be enclosed because of wildlife values, residual vegetation adjacent to the reservoirs would remain less than optimum.

Residual vegetation needed by ground nesting wildlife would be enhanced by periodic deferments provided through the current grazing management practices. Quantity as well as quality of forage would also be enhanced.

Management of prairie dogs and noxious weed control would not have significant impacts.

The sale of 200 acres and exchange of 1,000 acres annually would mean the change of administration on that wildlife habitat. There is also some potential through exchange to gain lands having equal or greater wildlife habitat values which would benefit from public ownership. With less than one percent of the public lands considered for disposal, there would be insignificant impacts on wildlife habitat resources. Land use changes through R&PP actions would have insignificant impacts on the wildlife resource, due to the small acreages involved.

Summary

There would be insignificant impacts to wildlife from the vegetation apportionment and lands actions. There would be no irretrievable or irreversible loss of the wildlife resource.

Lands

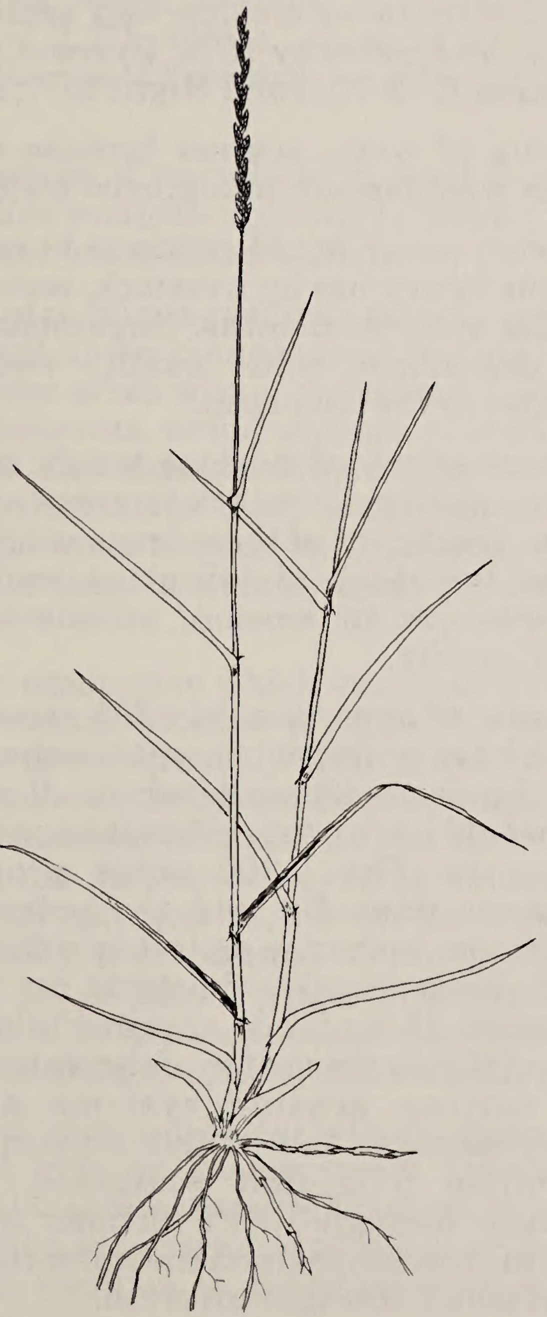
There would be no significant impacts on the lands resource resulting from continuation of present vegetation apportionment.

Sales of scattered and isolated tracts would result in a loss of approximately 200 acres annually from public ownership. Most of these lands are small, isolated tracts unusable by the public and inefficient to manage.

Exchanges totalling approximately 1,000 acres annually would result in a moderate increase in management efficiency and public use by consolidating scattered and isolated tracts and providing access to tracts of public land. Land use changes through R&PP actions would have no significant impact on the lands resource, due to the small acreages involved.

Summary

There would be no significant impact from vegetation apportionment actions. The impacts of sales on the reductions in the public land resource and the increases in management efficiency are insignificant. Exchanges would result in significant beneficial impacts on the public land resource and management efficiency. There would be no irreversible or irretrievable loss of the lands resource.



Western Wheatgrass

Economics

This alternative would not increase AUMs to livestock over the long term. Estimated costs to maintain present livestock and wildlife production total $504,000 over a 15-year period. (See Appendix C.) Over the long term no operation will receive increases or decreases in total AUMs. (See Appendices B, C and K.)

The 45,305 AUMs allocated by M and I allotments for livestock, assuming an 8-month use of public grazing lands, produces 5,663 animal units. Assuming a value of $400 per animal unit, these public lands contribute $2,265,250 annual gross income to the ranching industry.

Sales of 200 acres per year would result in counties losing PILT on these federal acres. However, this loss to counties would be replaced by increased property tax revenues.

The effect of 1,000 acres of exchanges per year might change county revenue sources, but would not affect the quantity of revenue. If an exchange occurs within one county, the county revenues from PILT and taxes would not change. If the exchange involves more than one county, the combination of PILT and county tax revenues for any one county could change. However, on a per acre basis, PILT and county revenues are similar. Thus, the net effect of the combined county tax and PILT revenues for each county would be insignificant.

Land use changes through R&PP actions would have insignificant economic impacts, due to the small acreages involved.

Summary

There are no significant impacts from the vegetation apportionment or lands actions.

ALTERNATIVE B

This alternative emphasizes the extensive (lower level) management of resources.

Soils

This alternative would result in 31,783 acres of fair condition range improving to good or better watershed condition in the long term through grazing management. Management of livestock would redistribute grazing away from critical areas such as flood plains and around reservoirs, where possible. These areas are subject to trampling and compaction, which reduce vegetation and increase runoff and erosion.

In addition, construction of two miles of fence and eight water sources annually would distribute the livestock to utilize upland areas and allow watershed conditions to stabilize or improve.

Approximately 1,666 acres have the potential to be mechanically treated over the long term, which would cause an estimated loss of 42 acre feet of soil from wind erosion. Wind erosion would cause an estimated .6 acre feet of soil loss from the construction of eight water sources annually (9 acre feet over 15 years), and an estimated .5 acre feet of soil loss from livestock trampling along two miles of new fence lines annually (8 acre feet over 15 years).

Prairie dog management would increase vegetative cover in the long term and reduce runoff and erosion in managed prairie dog towns.

Noxious weed control would initially kill undesirable vegetation, leaving dead plant residue that would help control wind and water erosion. In the long term, the treated areas would increase two range condition classes through an increase of desirable plant species and reduced erosion hazards.

In the short term, there would be an estimated loss of 59 acre feet of soil through wind erosion from project construction and mechanical treatment. In the long term, with proper mitigation, there would be no significant losses of soil.

The sale of 300 acres annually would not impact the soils resource except where there may be a change in land use or type. The type of change made, i.e., agriculture and road or construction activity and the area's erosion hazard, would determine the amount of impact on adjacent public soils and watershed. This is expected to be an insignificant loss.

The exchange of 1,000 acres annually and the potential for a 65,000 acre exchange project over the long term would not impact the soils or watershed resource. However, newly consolidated areas the BLM may receive through exchange actions may be in such vegetational or erosional condition to require an activity plan to improve the affected watershed.

Land use changes through R&PP actions would have insignificant impacts on the soils resource, due to the small acreages involved.

Summary

Impacts to the soils resource from vegetation apportionment and land actions would be insignificant. The impacts to the soils resource would be irretrievable but not irreversible.

Hydrology

Grazing systems and range improvement projects would improve fair condition lands in M and I category allotments to good or better range condition. Generally, an improvement in range condition results in an improvement in watershed condition. Assuming this holds true, accelerated erosion and sedimentation would be slowed to more closely resemble natural geologic erosion.

Improved grazing systems, fencing, and proper placement of new water sources would discourage livestock from concentrating in overgrazed areas. Mechanical treatments would improve those areas that did not respond to grazing management. The result would be improved basal ground cover, reduced overland water flow and reduced erosion and sedimentation (Wight and Sidoway 1972; Ryerson et al 1980; Saulman 1973; Neff and Wight 1977; Neff 1980).

Fencing of water sources because of wildlife values would result in improved water quality.

Riparian areas would continue to receive continuous heavy use by livestock, especially during the summer months. Streambank erosion and degradated water quality would slowly increase in the long term.

Concentrations of noxious weeds and prairie dog towns force livestock to graze noninfested areas. Treatment of these areas would result in better livestock distribution and a slight improvement in erosion, sedimentation and water quality.

The sale of approximately 300 acres annually would have no impact on water resources. Since these lands are all scattered, small parcels, the sale would have no significant impact on water resources. The 1,000 acres proposed for exchange annually and the potential for a 65,000-acre exchange project over the long term could have positive impacts on the water resources. If the lands acquired allow BLM to control the major portion of the watershed, then the various grazing systems and range improvements could reduce erosion and sedimentation from that watershed. Land use changes through R&PP actions would have insignificant impacts on the water resource, due to the small acreages involved.

Summary

Erosion and sedimentation would decrease as range condition improves. Water quality would improve. Soil loss would be irretrievable but not irreversible. Reduction of accelerated sediment yields would be insignificant relative to total sediment yields. Land sales would not impact water resources. Land exchanges have insignificant impacts on the water resources.

Range

Vegetation

Apportionment of vegetation would be 28 percent (45,305 AUMs) to livestock, and 72 percent (116,103 AUMs) to watershed andwildlife forage and cover in the short term and 25 percent (42,934 AUMs) and 75 percent (128,802), respectively, in the long term. Areas in less than good condition are generally a result of overuse caused by range improvement placement, terrain, or special use situations, i.e., calving pastures, spring range, hospital pastures, etc. A reduction of 2,371 AUMs, which is an apportionment change of 5 percent, would occur in the long term.

The percentage of rangeland in good to excellent condition would increase by 17 percent with management under this alternative.

The trend of public rangelands would continue to be upward under management by this alternative. Those areas with a downward trend on M or I allotments would change to stable or improving. The changes would occur sooner with this alternative than in Alternative A. There would be no change on C category allotments, since present management would continue.

Vegetation production which would result from the application of this alternative would increase on those acres (31,783) in fair condition as they improve through grazing management or are mechanically treated. Fair condition land which did not respond to grazing system or management changes (1,666 acres) could be mechanically treated and would yield an increase of 390 AUMs of forage. These practices would be used to increase forage and cover for watershed protection and/or rehabilitation.

Vegetation communities which improved because of grazing management actions or mechanical treatment would increase in plant vigor, density, diversity and would provide better cover in addition to production values discussed above.

Prairie dog management would have an immediate effect of improving vegetative production and range condition. Production would increase because of improved plant vigor and the transition of the plant community from low to high producing species. Increased vegetation, shade and litter would increase site moisture retention and improve plant growth conditions.

Control of noxious weeds would result in an increase of desirable plant species, range condition, species diversity and useful vegetation production.

Livestock

The apportionment of vegetation to livestock under this alternative would be 28 percent in the short and 25 percent in the long term.

The number of allotments in each category would be the same as in Alternative A. Allotments could move from M and C categories to the I category if significant resource problems were identified by any activity. Conversely, as resource problems are resolved, I allotments could move to M or C categories.

Management intensity would continue at its current level in the short term (four BLM administered AMPs). More intense management would be required to resolve resource problems which may occur, to improve range conditions, or to provide rest and deferment for mechanically treated areas.

The preference and estimated production of M and I allotments and how they would be affected by this alternative is shown in Appendix B in the short and long term. Thirty-seven allotments could be reduced and 30 allotments could receive increases in the long term and a long-term reduction of 2,371 AUMs could occur.

The development of two miles of fence and eight water sources annually would reduce available forage very little but would improve the overall condition of the allotments by providing for more even distribution and utilization.

There would be an average loss of approximately 82 AUMs annually from land sales. The sale of these tracts would result in reduced grazing administrative costs.

A similar amount of vegetation production may be gained from exchanges and no significant losses of AUMs should occur. Exchanges which consolidate tracts of public land could result in more efficient grazing administration.

Land use changes through R&PP actions would have no significant impact on the range resource, due to the small acreages involved.

Summary

There is a significant improvement in trend and condition of the range due to vegetation apportionment actions. Decreases of 2,371 livestock AUMs would be insignificant (less than 10 percent). Generally, there would be insignificant impacts on 37 allotments and positive impacts on 30 allotments in the long term. Land sales and exchanges would have insignificant impacts on the range resource. There would be irretrievable but not irreversible loss of 2,371 permitted AUMs.

Wildlife

Vegetation apportionment on the M and I allotments for watershed and wildlife forage and cover of 121,056 AUMs in the short term and 128,802 AUMs in the long term, an increase in 12,699 AUMs, would have favorable impacts on wildlife by providing additional forage.

Riparian areas with historically heavy use by livestock would continue to see little or no reproduction of the woody species. Condition as well as age class diversity would be reduced. Eventually some riparian areas may be lost.

Mechanical treatments of up to 1,666 acres on M and I allotments would have slight negative impacts on wildlife habitat in the short term. But the effect on wildlife habitat would be beneficial in the long term. Vegetation manipulation would alter the wildlife population density and diversity in the treated areas, temporarily displacing wildlife in the short term. But the increase in succulent spring grass and forbs would benefit some species seasonally.

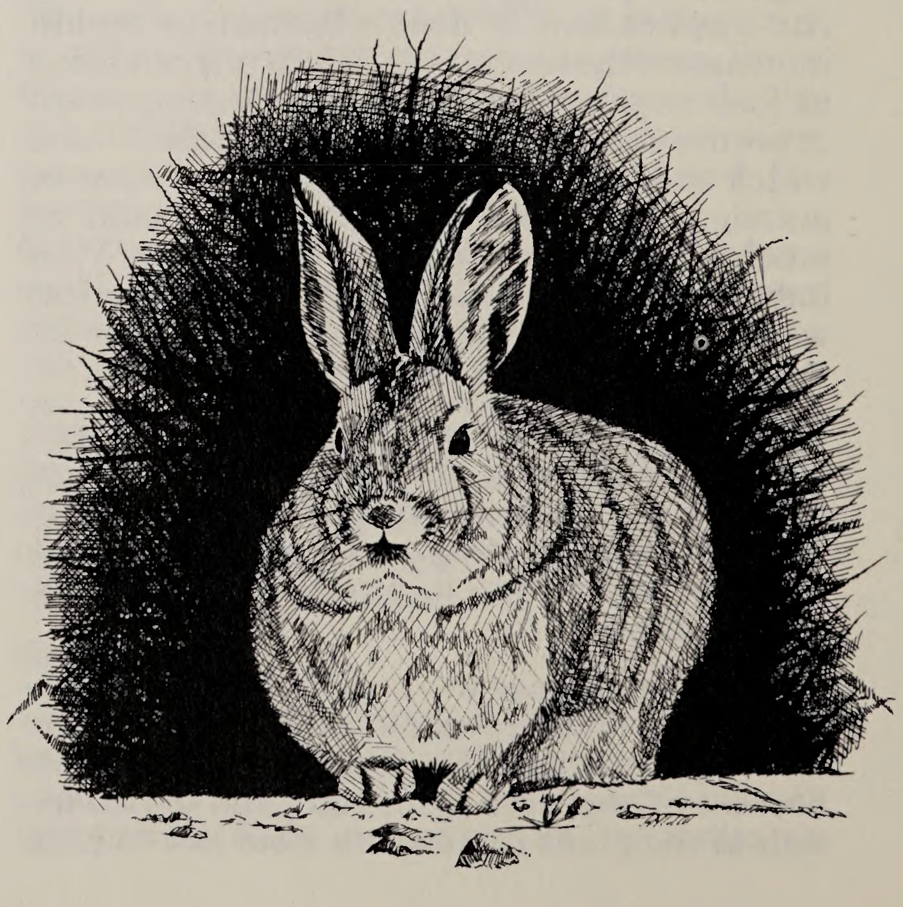
Range improvements of two miles of fence and eight water sources developed annually, would displace wildlife temporarily, due to habitat disruption and increased human activity. However, the additional water sources would be beneficial to wildlife by breaking up heavy concentrations of livestock at overused watering sites and by providing additional water sources for wildlife.

Improving trend and range condition would result in improved wildlife habitat over the long term.

The fencing of selected water sources because of wildlife values would protect the residual vegetation around these water sources, increasing the amount of residual vegetation available as food and cover for wildlife. Fencing would also improve the water quality of these water sources for fisheries habitat. Construction of islands in selected water sources would provide additional habitat for waterfowl.

Allotments having intensive grazing management application would be beneficial to wildlife because the quality and quantity of forage would be enhanced.

The sale of 300 acres and exchange of 1,000 acres annually, and the potential for a 65,000-acre exchange project over the long term, would mean the change of administration on that wildlife habitat. The potential exists to exchange lands, having equal or greater wildlife habitat values, which would benefit from public ownership. The public lands considered for disposal through sales could have insignificant negative impact on wildlife habitat resources if the lands were converted to uses incompatible with wildlife. Land use changes through R&PP actions would have insignificant impacts on the wildlife resource, due to the small acreages involved.



Summary

Over the long term, improved range condition and most developments would have significant beneficial impacts on wildlife. In the short term, some mechanical treatments could displace wildlife, temporarily, resulting in an insignificant impact. There would be insignificant impacts on wildlife, due to lands actions. There would be no irretrievable or irreversible loss of the wildlife resource.

Lands

There would be no impacts on the lands resource resulting from vegetation apportionment.

Sale of scattered and isolated tracts would result in a loss of 300 acres annually from public ownership. Most of these lands are small, scattered, isolated tracts unusable by the public and inefficient to manage as part of the public land system.

Exchanges of 1,000 acres annually and the potential for a 65,000 acre exchange project over the long term would result in a significant increase in management efficiency and public use by consolidating scattered, isolated tracts and providing access to tracts of public land. Disposal under the R&PP actions would result in no significant impacts on the lands resource, due to the small acreages involved. Disposal actions (sales and exchanges) within the retention zone would be considered on their own merits. (See South Dakota Resource Area Map in map pocket.)

Summary

There would be no impacts from vegetation apportionment. The impacts of sales on the reductions in the public land resource and the increases in management efficiency are insignificant. Exchanges would result in significant beneficial impacts on the public land resource and management efficiency. There would be no irreversible or irretrievable loss of the lands resource.

Economics

In the long term, livestock AUMs would be 2,371 less than present and wildlife AUMs would increase by 12,699 AUMs. This would require an additional cost of $33,320 above the present situation over 15 years to implement. Assuming an 8-month use of BLM lands, 296 animal units would be lost. Assuming $400 per animal unit, operations could lose $118,400 in annual gross income or approximately $25,000 in ranch income. Over the long term, a total of 37 operations may receive reductions of AUMs and 29 operations may receive increases. Of the 37 operations with reductions in total AUMs, only one operation has a decrease greater than 10 percent. Of the 29 operations with increases, eight operations have increases greater than 10 percent. (See Appendices, B, C, and K.)

Sales of 300 acres per year would result in counties losing PILT payments on these federal acres. However, this loss to counties would be replaced by increased property tax revenues.

The effect of exchanges differs depending on whether fee land or state land is involved. If an exchange occurs between BLM and a fee owner within one county, the county revenues from PILT and taxes would not change. If the exchange involves more than one county, the combination of PILT and county tax revenues for any one county could change. However, on a per acre basis, PILT and county revenues are similar. Thus, the net effect of the combined county tax and PILT revenues for each county would be insignificant. The situation is different for exchanges between the State of South Dakota and BLM, because state lands acquired by the BLM are not eligible for PILT. The impacts to state revenues would remain unchanged because the total state owned acreage would remain constant.

Ranchers at present are paying $6.03 per AUM (1984) to the State of South Dakota and are also making payments comparable to taxes to the counties for those lands grazed. In comparison, ranchers at present are paying $1.37 per AUM (1984) for grazing on federal acres, and no taxes on these lands go to the county. Consequently, ranchers who are grazing on state lands can expect to pay a lesser fee when ownership of the acreage becomes federal, and those ranchers who are grazing on federal land would pay more after the lands are exchanged to the state.

Land use changes through R&PP actions would have insignificant impacts on the economic resource, due to the small acreages involved.

Summary

One operation may have a significant decrease in total AUMs and eight may have increases that are significant (greater than 10 percent). There would be no significant impacts from sale or exchange between BLM and fee owners. Exchanges between the BLM and the state could cause significant impacts on county PILT revenues and operations whose state grazing acreage increases.

ALTERNATIVE C

This alternative is intensive management with an emphasis on the range resource.

Soils

This alternative would result in 31,783 acres of fair condition range improving to good or better watershed condition in the long term through grazing management. Management of livestock would redistribute grazing away from critical areas such as flood plains and around reservoirs, where possible. These areas are subject to trampling and compaction, which reduce vegetation and increase runoff and erosion.

In addition, construction of two miles of fence and eight water sources annually would distribute the livestock to utilize upland areas and allow watershed conditions to stabilize.

Approximately 9,781 acres have the potential to be mechanically treated or converted to tame pasture over the long term, which would cause an estimated loss of 244 acre feet of soil from wind erosion. Wind erosion would cause an estimated .6 acre feet of soil loss from the construction of eight water sources annually (9 acre feet over 15 years) and an estimated .5 acre feet of soil loss from livestock trampling along two miles of new fence lines annually (8 acre feet over 15 years).

Prairie dog management would increase vegetative cover in the long term and reduce runoff and erosion in managed prairie dog towns.

Noxious weed control would initially kill undesirable vegetation, leaving dead plant residue that would help control wind and water erosion. In the long term, the treated areas would increase two range condition classes through an increase of desirable plant species and reduced erosion hazards.

In the short term, there would be an estimated loss of 261 acre feet of soil through wind erosion from project construction, mechanical treatment and pasture conversion. In the long term, with proper mitigation, there would be no significant loss of soil.

The sale of 300 acres annually would not impact the soils resource except where there may be a change in land use or type. The type of change made, i.e., agriculture and road or construction activity and the area's erosion hazard, would determine the amount of impact on adjacent public soils and watershed. This is expected to be an insignificant loss.

The exchange of 1,000 acres annually and the potential for a 65,000-acre exchange project over the long term would not impact the soils or watershed resource. However, newly consolidated areas the BLM may receive through exchange actions may be in such vegetational or erosion condition to require an activity plan to improve the affected watershed.

Land use changes through R&PP actions would have insignificant impacts on the soils resource, due to the small acreages involved.

Summary

Impacts to the soils resource from vegetation apportionment and land actions would be insignificant. The impacts to the soil resource would be irretrievable but not irreversible.

Hydrology

Grazing systems and range improvement projects would improve fair condition lands in all I and M category allotments to good or better range condition. An improvement in range condition generally results in an improvement in watershed condition. Assuming this holds true, accelerated erosion and sedimentation would be slowed to near natural geologic erosion rates.

Grazing systems, fencing and proper placement of new water sources would discourage livestock from concentrating on currently overgrazed areas. Mechanical treatments and tame pasture conversion would improve those areas that did not respond with grazing management, with resulting increases in basal ground cover. Overland flow, erosion and sedimentation would be greatly reduced (Wight and Sidoway 1972; Ryerson et al 1980; Saulman 1973; Neff and Wight 1977; Neff 1980) thus increasing reservoir life and efficiency. Water quality would be improved as sedimentation is reduced.

Fencing of water sources because of wildlife values would result in improved water quality. Fencing of water sources because of wildlife values would also result in improved water quality.

Riparian areas would continue to receive continuous heavy use by livestock, especially during the summer months. Streambank erosion and degradated water quality would slowly increase in the long term.

Concentrations of noxious weeds and prairie dog towns force livestock to graze noninfested areas. Treating these areas would result in better livestock distribution and a slight improvement in erosion, sedimentation and water quality.

Approximately 300 acres would be proposed for sale annually. Since these lands are all scattered small parcels, the sale would have no significant impact on water resources. The 1,000 acres proposed for exchange annually and the potential for a 65,000-acre exchange action over the long term could have positive impacts on the water resources. Lands gained would consolidate public land and in many cases would allow BLM to control the major portion of watershed. In accordance with vegetation apportionment actions of this alternative, the acquired lands would be upgraded to good or better range condition. Erosion and sedimentation would be reduced to near natural geologic erosion rates. Land use changes through R&PP actions would have insignificant impacts on the water resources, due to the small acreages involved.

Summary

Erosion and sedimentation would decrease as range condition improves. Soil losses would be irretrievable but not irreversible. Reduction of accelerated sediment yields would be insignificant relative to total sediment yields. Lands sales would not impact water resources. Land exchanges would have insignificant impacts on the water resources.

Range

Vegetation

The percent of vegetation apportioned to the various uses in the short term would generally be 28 percent (45,305 AUMs) to livestock and 72 percent (116,103 AUMs) to watershed and wildlife forage and cover and 31 percent (57,512 AIMs) and 69 percent (130,257 AUMs), respectively, in the long term. Production on lands converted to tame pasture (8,115 acres) would be apportioned to livestock and the other resources would only receive incidental use.

All rangelands not converted to tame pasture would be managed to achieve excellent or good range condition, with the exception of C allotments which would continue under present management.

All public lands (167,686 acres) on M and I allotments would be in a stable or improving trend.

It is estimated that vegetation production would increase on a total of 37,859 acres which are in fair condition or which could be converted to tame pasture in this alternative. Vegetation production increases would result from three causes: first, a change in condition of non-treated lands, (28,078 acres/2,672 AUMs); second, a change in production of mechanically treated lands which did not respond to grazing management treatments, (1,666 acres/390 AUMs); and third, a change in production on lands converted to tame pasture (8,115 acres/14,098 AUMs).

Vegetation communities which improved in condition would increase in plant vigor, density, diversity, and provide better cover in addition to the production values discussed above. Vegetation on mechanically treated areas would respond in much the same way because of increased moisture infiltration and release from vegetative or physical limiting factors. Developed tame patures would be dominated by one or two species of domestic grasses.

Prairie dog management would have an immediate effect of improving vegetative production and range condition. Production would increase because of improved plant vigor and the transition of the plant community from low to high producing species. Increased vegetation, shade and litter would increase site moisture retention and improve plant growth conditions.

Control of noxious weeds would result in an increase of desirable plant species, range condition, species of diversity and useful vegetation production.

Greasewood

Livestock

There would be a substantial increase in the apportionment of forage to livestock under this alternative. The livestock apportionment would be 28 percent in the short term. The apportionment to livestock would be 31 percent on native range and mechanically treated lands in the long term. Those pastures converted to tame pasture would be developed primarily for livestock. There would be an increase of 14,098 AUMs resulting from that conversion. Mechanical treatment of suitable lands (1,666 acres) which were not converted to tame pasture would yield an additional 390 AUMs for livestock.

Allotments could move from M and C categories to the I category if significant resource problems were identified by any activity. Conversely, as resource problems are resolved, I allotments could move to M or C categories.

Management intensity would continue at the current level in the short term (four BLM administered AMPs). Intense management would be required for allotments with resource problems, low range conditions, or on which mechanical treatment or tame pasture development occurred.

In the long term, depending on the results of monitoring, there would be 45 allotments receiving increases in authorized use and 23 allotments would be reduced. The total apportionment would then be 12,207 AUMs above the present.

The development of two miles of fence and eight water sources annually would reduce available forage very little, but would improve the overall condition of the allotments by providing for more even distribution and utilization.

There would be an average loss of approximately 82 AUMs annually from land sales. The sale of these tracts would result in reduced grazing administrative costs.

A similar amount of vegetation production may be gained from exchanges and no significant losses of AUMs should occur. Exchanges which consolidate tracts of public land could result in more efficient grazing administration.

Land use changes through R&PP actions would have no significant impacts on the range resource, due to the small acreages involved.

Summary

There is a significant improvement in trend and condition of the range resource due to vegetation apportionment actions. An increase of 12,207 livestock AUMs would be significant. Generally, there would be insignificant negative impacts on 23 allotments and positive impacts on 45 allotments in the long term. Land sales and exchanges would have insignificant impacts on the range resource. There would be no irretrievable or irreversible loss to the range resource.

Wildlife

Vegetation apportionment on M and I allotments for watershed and wildlife forage and cover of 121,056 AUMs in the short term and 130,257 AUMs in the long term, an increase of 14,154 AUMs, would have long term favorable impacts on wildlife by providing additional forage.

Riparian areas with historically heavy use by livestock would continue to see little or no reproduction of the woody species. Condition as well as age class diversity would be reduced. Eventually some riparian areas may be lost.

Mechanical treatments on 1,666 acres and tame pasture development of 8,115 acres on M and I allotments would have slight negative impacts on wildlife habitat in the short term. But the effect on wildlife habitat would be beneficial in the long term. Vegetation manipulation would alter the wildlife population density and diversity in the treated areas, temporarily displacing wildlife in the short term. But the increase in succulent spring grass and forbs would benefit some species seasonally. However, decreased vegetative diversity in areas converted to tame pasture could reduce the abundance and diversity of some wildlife species.

Range improvements of two miles of fence and eight water sources developed annually would displace wildlife temporarily due to habitat disruption and increased human activity. However, the additional water sources would be beneficial to wildlife. They would break up heavy concentrations of livestock at watering sites and would provide additional water sources for wildlife. By providing pastures with periods of deferment, residual vegetation needed by ground nesting wildlife would be enhanced.

Improving trend and range condition would result in improved wildlife habitat over the long term. The fencing of selected water sources because of wildlife values would protect the residual vegetation around these water sources, increasing the amount of residual vegetation available as food and cover for wildlife. Fencing would also improve the water quality of these water sources for fisheries habitat. Construction of islands in selected water sources would provide additional habitat for waterfowl.

Allotments having intensive grazing management application would be beneficial to wildlife because the quality and quantity of forage would be enhanced.

The sale of 300 acres and exchange of 1,000 acres annually and the potential for a 65,000-acre exchange project over the long term, would mean the change of administration on that wildlife habitat. The potential exists to exchange lands having equal or greater wildlife habitat value, which would benefit from public ownership. The public lands considered for disposal through sales could have insignificant negative impacts on wildlife habitat resources if the lands were converted to uses incompatible with wildlife. Land use changes through R&PP actions would have insignificant impacts on the wildlife resource, due to the small acreages involved.

Summary

Over the long term, improved range condition and most developments would have significant beneficial impacts on wildlife. In the short term, some mechanical treatments could displace wildlife temporarily, resulting in an insignificant impact. There would be insignificant impacts on wildlife due to lands actions. There would be no irretrievable or irreversible loss of the wildlife resource.

Lands

There would be no impacts on the lands resource resulting from vegetation apportionments.

Sales of scattered and isolated tracts would result in a loss of 300 acres annually from public ownership. Most of these lands are small, scattered, isolated tracts unusable by the public and inefficient to manage as part of the public land system.

Exchanges of 1,000 acres annually and the potential for a 65,000-acre exchange project over the long term, would result in a moderate increase in management efficiency and public use by consolidating scattered and isolated tracts and providing access to tracts of public land. Disposal under the R&PP actions would result in no significant impacts on the lands resource, due to the small acreages involved. Disposal actions (sales and exchanges) within the retention zone would be considered on their own merits. (See South Dakota Resource Area Map in map pocket.)

Summary

There would be no impacts from vegetation apportionment. The impacts of sales on the reductions in the public land resource and the increases in management efficiency are insignificant. Exchanges would result in significant beneficial impacts on the public land resource and management efficiency. There would be no irreversible or irretrievable loss of the lands resource.

Economics

This alternative would show an increase from the present 12,207 AUMs for livestock over the long term at an additional cost of $256,195. This is approximately $21 per livestock AUM gained when,implemented over the 15-year period. Assuming an 8-month use of BLM lands, 1,525 additional animal units would be supported. Assuming $400 per animal unit, $610,000 additional annual gross income or approximately $125,000 in ranch income could be provided to ranchers. Over the long term, a total of 23 operations may receive reductions of AUMs and 43 operations may receive increases. Of the 23 operations with reductions in total AUMs, none of the reductions are greater than 10 percent. Of the 43 operations with increases, 26 operations have increases greater than 10 percent. (See Appendices B, C, and K.)

Sales of 300 acres per year would result in counties losing PILT on these federal acres. However, this revenue loss to counties would be replaced by increased property tax revenues.

The effect of exchanges differs depending on whether fee land or state land is involved. If an exchange occurs between BLM and a fee owner within one county, the county revenues from PILT and taxes would not change. If the exchange involves more than one county, the combination of PILT and county tax revenues for any one county could change. However, on a per acre basis, PILT and county revenues are similar. Thus, the net effect of the combined county tax and PILT revenues for each county would be insignificant. The situation is different for exchanges between the State of South Dakota and BLM, because state lands acquired by the BLM are not eligible for PILT. The impacts to state revenues would remain unchanged because the total state owned acreage would remain constant.

Ranchers at present are paying $6.03 per AUM (1984) to the State of South Dakota and are also making payments comparable to taxes to the counties for those lands grazed. In comparison, ranchers at present are paying $1.37 per AUM (1984) for grazing on federal acres, and no taxes on these lands go to the county. Consequently, ranchers who are grazing on state lands can expect to pay a lesser fee when ownership of the acreage becomes federal, and those ranchers who are grazing on federal land would pay more after the lands are exchanged to the state. Land use changes through R&PP actions would have insignificant economic impacts, due to the small acreages involved.

Summary

Operations will have a significant decrease in AUMs and 26 may have increases that are significant (greater than 10 percent). There would be no significant impacts from sale or exchange between BLM and fee owners. Exchanges between the BLM and the state could cause significant impacts on county PILT revenues and operations whose state grazing acreage increases.

Kentucky Bluegrass

ALTERNATIVE D

This alternative emphasizes intensive management while protecting riparian areas and fragile soils.

Soils

This alternative would result in 31,783 acres of fair condition range improving to good or better watershed condition in the long term through grazing management. This alternative would also provide for the quickest improvement in the watershed to good or better condition through deferment of livestock grazing on M and I allotments on 29,306 acres of fragile soils and exclusion of livestock on 1,560 acres of riparian areas. As a result of an adjustment in livestock use during the wet spring season of the year and exclusion of livestock from riparian areas, there would be a reduction of soil trampling, compaction, stream bank sloughing, and an increase in vegetative ground cover. Use adjustments would allow plants time for phenological development, improved production and establishment of the optimum ground cover on the various range sites.

In addition, construction of two miles of fence and eight water sources annually would distribute the livestock to utilize upland areas and allow watershed conditions to stabilize.

Approximately 8,388 acres could be mechanically treated or converted to tame pasture over the long term, which would cause an estimated loss of 210 acre feet of soil from wind erosion. Wind erosion would cause an estimated .6 acre feet of soil loss from the construction of eight water sources annually (9 acre feet over 15 years) and an estimated .5 acre feet of soil loss from livestock trampling along 2 miles of new fence lines annually (8 acre feet over 15 years).

Prairie dog management would increase vegetative cover in the long term and reduce runoff and erosion in managed prairie dog towns.

Noxious weed control would initially kill undesirable vegetation, leaving dead plant residue that would help control wind and water erosion. In the long term, the treated areas would increase two range condition classes through an increase of desirable plant species and reduced erosion hazards.

In the short term, there would be an estimated loss of 227 acre feet of soil through wind erosion from project construction, mechanical treatment and pasture conversion. In the long term, with proper mitigation, there would be no significant loss of soil.

With the land being retained under the existing ownership pattern, there would be no impacts to the soil resource. R&PP actions would have no impacts to the soils resource, due to the small acreages involved.

Summary

Vegetation apportionment actions except for fragile soils and riparian areas would improve soils resource conditions insignificantly. Soils resource conditions would be improved significantly on fragile soils and riparian areas. Lands actions would have no impacts on the soils resource. The impacts to the soils resource would be irretrievable but not irreversible.

Hydrology

Grazing systems and range improvement projects would improve fair condition lands in all I and M category allotments to good or better range condition. Generally, an improvement in range condition implies an improvement in watershed condition. Assuming this holds true, accelerated erosion and sedimentation would be reduced to closely match rates of natural geologic erosion.

Seasonal deferments, fencing and proper placement of new water sources would encourage better livestock distribution. Adjustments in livestock use on 29,306 acres of fragile soils and livestock exclusion on riparian areas (1,560 acres) would allow increased plant density, vigor and root development and less soil compaction, especially around water sources and other areas where livestock tend to concentrate. Areas that do not respond to grazing management may be mechanically treated or converted to tame pasture, resulting in increased plant cover and reduced erosion and sedimentation (Wight and Sidoway 1972; Ryerson et al 1980; Saulman 1973; Neff and Wight 1977; Neff 1980). Water quality would be improved as sedimentation is reduced. Reservoir life and efficiency would be increased.

Fencing of riparian areas on 1,560 acres would result in less streambank erosion and improved water quality (Holcheck 1980). Fencing of water sources because of wildlife values would also result in improved water quality.

Concentrations of noxious weeds and prairie dog towns force livestock to graze noninfested areas. Treating these areas would result in better livestock distribution and a slight improvement in erosion, sedimentation and water quality.

No impacts to water resources would result from lands actions since all lands would be retained under current ownership. Land use changes through R&PP actions would have insignificant impacts on the water resource, due to the small acreages involved.

Summary

Erosion and sedimentation would decrease as range condition improves. Water quality would improve. Soil losses would be irretrievable but not irreversible. Reduction of accelerated sediment yields, except for fragile soils and riparian areas, would be insignificant relative to the total sediment yields. The reduced sediment yields for the fragile soils and riparian areas would be significant. Lands actions would have no significant impacts on water resources.

Range

Vegetation

Apportionment of the vegetation resource would change to favor wildlife and soils values. The apportionment would be 28 percent (45,305 AUMs) to livestock and 72 percent (116,103 AUMs) to watershed and wildlife forage and cover, in the short term and 28 percent (53,493 AUMs) and 72 percent (137,460 AUMs), respectively, in the long term. Vegetation communities in those 1,560 acres of riparian areas selected for special management would improve to climax condition and level off and stagnate because of the exclusion of livestock use. Adjustments of grazing use would be made on 29,306 acres of fragile soils during the wet spring season.

The percentage of rangeland in good to excellent condition would increase with management by this alternative.

The trend of public rangelands is generally upward and this trend would continue under management by this alternative. Those areas with a downward trend on M or I allotments would change to stable or improving. There would be no change on C category allotments, since present management would continue.

Vegetation production would be the same as in Alternative C except that improvement would be accelerated on fragile soils and in riparian areas.

Mechanical treatment could occur on 1,663 acres, and tame pasture conversion could be done on 6,725 acres annually to increase forage and/or cover for rangeland protection or rehabilitation.

Vegetation communities which improved in condition would increase in plant vigor, density, diversity, and provide better cover. Vegetation on mechanically treated areas would respond in much the same way because of increased moisture infiltration and release from vegetative or physical limiting factors. Developed tame pastures would be dominated by one or two species of domestic grasses.

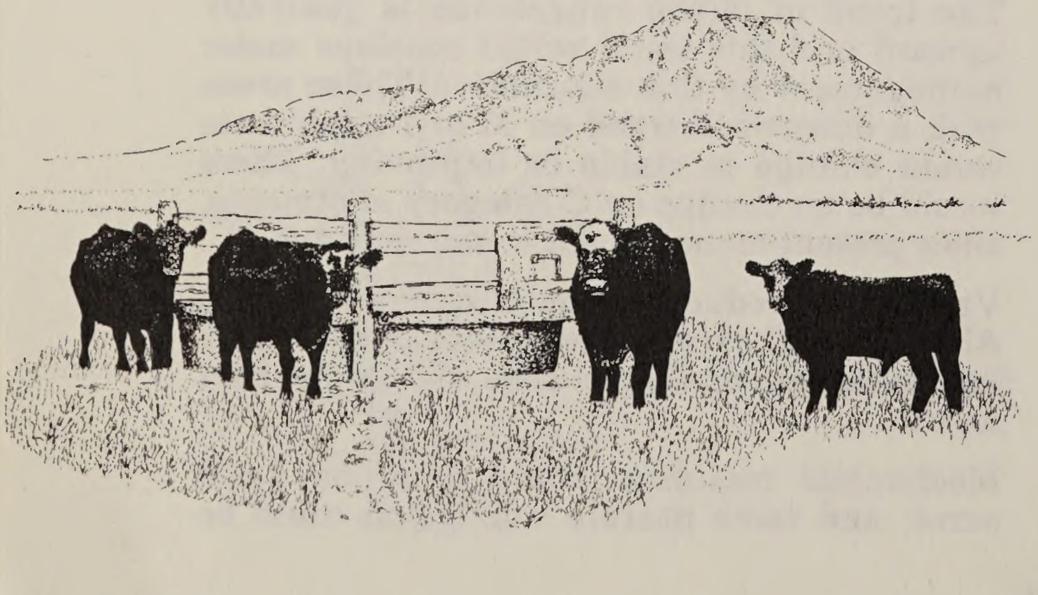
Prairie dog management would have an immediate effect of improving vegetative production and range condition. Production would increase because of improved plant vigor and the transition of the plant community from low to high producing species. Increased vegetation, shade and litter would increase site moisture retention and improve plant growth conditions.

Control of noxious weeds would result in an increase of desirable plant species, range condition, species diversity and useful vegetation production.

Livestock

Livestock would be apportioned 45,305 AUMs in the short term and 53,493 AUMs in the long term, an increase of 8,188 AUMs over the present situation.

Allotments could move from M and C categories to the I category if significant resource problems were identified by any activity. Conversely, as resource problems are resolved, I allotments could move to M or C categories.



Management intensity would continue at its current level in the short term (four BLM administered AMPs). More intense management would be required to resolve resource problems which may occur, to improve range conditions, or to provide rest and deferment for mechanically treated areas.

Exclusion of livestock from riparian areas on 37 allotments and deferment of grazing on 29,306 acres of fragile soils on 26 allotments during the wet spring season could cause increased use of other lands, the reduction of herd sizes, or development of tame pasture to replace lost forage. Thirty allotments could be reduced and 38 increased in the long term. The total number of allotments affected by exclusion from riparian areas or required grazing deferment would be 52.

Intensive management would be required on these allotments to offset the adjustments discussed above and to provide forage by improving range condition, mechanical treatment, and tame pasture development. A short-term loss of forage would occur on lands converted to tame pasture or mechanically treated.

Some range improvements would be required, in addition to the two miles of fence and eight water sources developed annually to fence riparian areas and to replace water sources lost by exclusion from riparian and fragile soil areas. The development of these improvements would reduce available forage very little, but would improve the overall condition of the allotments by providing for more even distribution and utilization.

There would be no loss of AUMs from land sales or exchanges, since none would occur. R&PP actions would have insignificant impacts, due to the small acreages involved.

Summary

There is significant improvement in trend and condition f the range resource due to vegetation apportionment actions. Increases of 8,188 livestock AUMs would be significant. Generally, there would be insignificant negative impacts on 30 allotments and positive impacts on 38 allotments in the long term. There would be no impacts from lands actions. There would be no irretrievable or irreversible loss to the range resource.

Wildlife

Vegetation apportionment for watershed and wildlife forage and cover of 122,345 AUMs in the short term and 137,460 AUMs in the long term, an increase of 21,357 AUMs, would be very beneficial to wildlife by providing additional forage.

Fencing the riparian areas (1,560 acres) and constructing new range improvements away from these areas would improve the condition and age class diversity of the woody vegetation. This would result in an increase in residual vegetation available as food and cover for all wildlife species. An adjustment of livestock use during the wet spring season would improve the quality and quantity of forage, especially forbs.

Mechanical treatment of 1,663 acres and tame pasture development of up to 6,725 acres on M and I allotments would have slight negative impacts on wildlife habitat in the short term. But the effect on wildlife habitat would be beneficial in the long term. Vegetation manipulation would alter the wildlife population density and diversity in the treated areas, temporarily displacing wildlife. But the increase in succulent spring grass and forbs would benefit some species seasonally. However, decreased vegetative diversity in areas converted to tame pasture could reduce the abundance and diversity of some wildlife species.

Range improvements of two miles of fence and eight water sources developed annually would displace wildlife temporarily, due to habitat disruption and increased human activity. However, the additional water sources would be beneficial to wildlife. They would disperse heavy concentrations of livestock at watering sites and would provide additional water sources for wildlife.

Improving trend and range condition would result in improved wildlife habitat over the long term.

The fencing of selected water sources because of wildlife values would protect the residual vegetation around these water sources, increasing the amount of residual vegetation available as food and cover for wildlife. Fencing would also improve the water quality of these water sources for fisheries habitat. Construction of islands in selected water sources would provide additional habitat for waterfowl.

Allotments having intensive grazing management application would be beneficial to wildlife because the quality and quantity of forage would be enhanced.

There would be no loss of wildlife habitat on the public lands without land disposals.

Land use changes through R&PP actions would have insignificant impacts on the wildlife resource, due to the small acreages involved.

Summary

Over the long term, improved range condition and most developments would have significant beneficial impacts on wildlife. In the short term, some mechanical treatments could displace wildlife temporarily, resulting in an insignificant impact. There would be insignificant impacts on wildlife due to lands actions. There would be no irretrievable or irreversible loss of the wildlife resource.

Lands

There would be no impacts on the lands resource resulting from vegetation apportionment.

No sales or exchanges would result in the continued, inefficient management of the scattered and isolated tracts. This would not provide for better public use or management efficiency of those public lands. R&PP applications from qualified applicants would be addressed and would result in no significant impacts on the lands resource, due to the small acreages involved.

Summary

There would be no impacts from vegetation apportionment. There would be a lack of opportunity to consolidate scattered tracts. The opportunity to improve public benefits and increase management efficiency would be foregone. This is an insignificant impact for public land sales. It is a significant impact for exchange actions. There would be no irreversible or irretrievable loss of the lands resource.

Economics

This alternative would show an increase from the present of 8,188 AUMs for livestock over the long term at an additional cost of $201,385. This is approximately $25 per additional livestock AUM gained over the 15-year period. Assuming an 8-month use of BLM lands, 1,023 additional animal units could be supported. At $400 per animal unit, $409,200 additional annual gross income or approximately $82,000 in ranch income could be made available to some ranchers. Over the long term, a total of 28 operations may receive reductions of AUMs and 38 operations may receive increases. Of the 28 operations with reductions in total AUMs, one operation has reductions greater than 10 percent. Of the 38 operations with increases, 21 operations have increases greater than 10 percent. (See Appendices B, C, and K.)

There would be no change to federal, state or county revenues from this alternative due to the lack of sales or exchanges. Land use changes through R&PP actions would have insignificant economic impacts, due to the small acreages involved.

Summary

One operation may have decrease in total AUMs and 21 may have increases that are significant (greater than 10 percent).

CONSULTATION AND COORDINATION

PREPARATION

The South Dakota RMP was prepared by specialists from the Miles City District Office, South Dakota Resource Area, Big Dry Resource Area and Powder River Resource Area with assistance and guidance from the BLM Montana State Office. Disciplines and skills used to develop this RMP were: vegetation and rangeland use, geology, hydrology, recreation, soils, cultural resources, lands, paleontology, economics, wildlife, fisheries, animal science, forestry, community planning, graphics, editing, printing, public affairs and typing. Preparation of this RMP began in 1982 with announcement in the *Federal Register,* Volume 47, No. 108, June 4, 1982.

PUBLIC PARTICIPATION

A letter and brochure explaining our planning process and citing the counties and acreage of public lands involved in the RMP planning were mailed to about 2,000 addressees on June 18, 1982. The letter included a response card for return of comments and for an expression of and desire to remain on the mailing list for further RMP information.

An open house to invite public comment on the scope of the RMP was held on July 12, 1982, at the South Dakota Resource Area Office in Belle Fourche, South Dakota. Announcement of that meeting was made in newspapers and in the above-mentioned letter.

A call for coal resource information was made in the *Federal Register,* Volume 47, No. 166, August 26, 1982 and in letters to about 25 firms and individuals known to be interested in mineral resources.

An update brochure was sent to 765 addressees on May 24, 1983, summarizing the results of scoping and indicating our emphasis would be focused on classification of the public lands for adjustment and on vegetation management for livestock, wildlife and watershed protection.

This RMP is being mailed to about 400 addressees on our gathered mailing list and to 439 grazing permittees.

AGENCIES AND ORGANIZATIONS CONSULTED

The South Dakota RMP team consulted and/or received comments from the following organizations and agencies during the preparation of the document:

American Agriculture Movement
American Institute of Mining Engineers
American Mining Congress
Audubon Society
Black Hills Alliance
Black Hills, Badlands and Lakes Association
Black Hills Council of Local Government
Black Hills 4-Wheelers
Advisory Council on Historic Preservation
Center of the Nation Sportsmens Club
Deadwood Chamber of Commerce
Hills and Plains Sportsmens Club
Independent Stockgrowers Association
Izaak Walton League
Lead Chamber of Commerce
National Wildlife Federation
Natural Resources Defense Council
Public Lands Council
Public Lands Grazing Council
Rocky Mountain Oil and Gas Association
Sierra Club
South Dakota Association of County Officials
South Dakota Association of Telephone Cooperatives
South Dakota Association of Realtors
South Dakota Chamber of Commerce
South Dakota Land Users
South Dakota Livestock Association
South Dakota Beef Industry Council
South Dakota County Agents Association
South Dakota Farmers Union
South Dakota Goose Association
South Dakota Independent Oilmens Association
South Dakota National Farmers Organization
South Dakota Petroleum Association
South Dakota Rural Electric Association
South Dakota Society for Range Management
South Dakota Sheepgrowers Association
South Dakota State Association of Conservation Districts
South Dakota Stockgrowers Association
South Dakota Wildlife Federation
South Dakota Woolgrowers
Sturgis Chamber of Commerce
The Wilderness Society
Western South Dakota Sheepgrowers
Wildlife Society of South Dakota

Local, State and National Government Elected Officials

U.S. Senator James Abdnor
Congressman Tom Daschle
U.S. Senator Larry Pressler

Mayors of:

Faith
Fort Pierre
Sturgis

South Dakota State Senators of the Thirteen Counties, Including:

James Dunn
Carl Ham
Lyndell Peterson

South Dakota State Representatives of the Thirteen Counties, Including:

George Blair
John Brown
Eugene Christensen
Larry Gabriel
James Hood
Kay Jorgenson
N F Lyon
John Manke
G F Mortimer
Gordon Pederson
Joel Rickenbach

State Officials of

Governor William J. Janklow
Department of Agriculture
Archaeological Research Center
A-95 Coordinator
Department of Commerce
Department of Economic and Tourism Development
Bureau of Planning
Office of Energy Policy
Department of Health
State Extension Services
Forestry Division
Geological Survey
Department of Game, Fish and Parks
Department of Education an Cultural Affairs
Department of Labor
Department of School and Public Lands

Department of Revenue
Department of Public Safety
Department of Social Services
Department of Transportation
Department of Military and Veteran Affairs
Department of Water and Natural Resources
South Dakota School of Mines
University of South Dakota

Local Government

County Commissioners of

Brule
Butte
Custer
Fall River
Haakon
Harding
Jackson
Lawrence
Lyman
Meade
Pennington
Perkins
Stanley

Planning Boards

District I
District V
Custer County
Lawrence County
Pennington County
Lead
Rapid City
Spearfish

Wyoming

Planning Coordinator—Governor's Office
Game and Fish Department
Department of Agriculture
Department of Economic Planning and Development
Crook County

Indian Tribes

Cheyenne River
Crow Creek
Lower Brule
Oglala Sioux
Pine Ridge Sioux
Standing Rock Sioux (North Dakota)
United Sioux Tribes

Federal Agencies

Branch of Onshore Minerals Records—Casper, Wyoming
Newcastle (Wyoming) Resource Area, Bureau of Land Management
U.S. Air Force
Bureau of Indian Affairs
Soil Conservation Service
Black Hills National Forest
Custer National Forest
Nebraska National Forest
Black Hills Area RC & D
Office of Mineral Data Analysis—Bureau of Mines
Fish and Wildlife Service
Jewel Cave National Monument
Mount Rushmore National Memorial
Wind Cave National Park
Federal Highway Administration
U.S. Geological Survey
National Park Service
Badlands National Park
Office of Surface Mining

Individuals

Individual BLM and NFS livestock grazing operators and many individuals were contacted for their views on the South Dakota public land planning and resources.

LIST OF PREPARERS

The following people prepared the RMP:

Steering Committee

Robert Teegarden, Chairman. BS Natural Sciences, Montana State University. He provided District policy and oversight to the RMP project. He has been with the BLM for 23 years.

Jim Beaver, MSO Coordinator. BS Wildlife Management, Humboldt State University. He represented the Montana State Office and provided headquarters policy, oversight and coordination to the RMP project. He has been with the BLM for 11 years.

Billy McIlvain, South Dakota Resource Area Manager. BS Agronomy, Texas Tech University; MS Range, University of Idaho. He provided Resource Area policy and oversight to the RMP project. He has been with the BLM for 22 years.

Project Team

Chris Roholt, Project Manager. BS Mathematics and Economics, MS Forestry/Economics, University of Montana. He was responsible for the overall development and coordination of the RMP project and also served as team leader. He has been with BLM for six years.

Amy Fraley, Technical Coordinator (through November, 1984). BS Resource Management, University of Wisconsin at Stevens Point. She was responsible for the coordination of schedules and accuracy of technical information. She was also responsible for coordinating with MSO on graphic displays in the document. She has been with BLM for four years.

Judith Bartley, Technical Coordinator. BS Forestry, MS Recreation/Land Use Planning, University of Missouri at Columbia. She was responsible for the coordination of schedules and accuracy of technical information. She also was responsible for coordinating with MSO on graphic displays in the document. The wrote the social assessment portion of the RMP. She has been with BLM for one year.

Leon Pack, Vegetation Apportionment Issue Leader. BS Life Science Education, MS Wildlife Biology, Utah State University. He wrote the range portion. He has been with BLM for 10 years.

Chuck Berdan, Lands Issue Leader. Associate Degree of Applied Science Natural Resource Management, University of Minnesota at Crookston; BS Wildlife and Fisheries, South Dakota State University. He wrote the lands portion. He has been with BLM for six years.

William Volk, Soil Scientist. BS Agriculture Production, MS Soils, Montana State University. He prepared the soils section and assisted with the watershed and range portions. He has been with BLM for six years.

Joe Frazier, Hydrologist. BS Business Administration, University of Kansas; MS Aquatic Biology, Emporia State University; MS Hydrology, University of Wyoming. He prepared the hydrology portion. He has been with BLM for four years.

Dale Tribby, Natural Resource Specialist. BS Wildlife Management and Biology, South Dakota State University. He assisted in preparation of the range portion and wrote the wildlife section. He has been with BLM for six years.

Jerry Clark, Archaeologist. BA Anthropology, University of Montana; MA Anthropology, Washington State University. He prepared the cultural resource section and has been with BLM for nine years.

Ron Wickline, Natural Resource Specialist. BS Forestry and Soils, University of Montana. He wrote the forestry portion and has been with BLM for four years.

Dennis Bucher, Forestry Technician. BS Biology, Black Hills State College. He assisted in the preparation of the forestry portion by providing photo interpretation, overlays and other information. He was been with BLM for five years.

Dale Hanson, Range Conservationist. BS Wildlife Science, New Mexico State University. He wrote the paleontologic portions and has been with BLM for seven years.

Ken Hanify, Natural Resource Specialist. BS Science and Industrial Arts, South Dakota State University; MA Biology, Northern Arizona University. He wrote the section on recreation. He has been with the BLM for six years.

Jim Gruber, Geologist. BS Geology, California State University at Chico. He wrote the Management Situation Analysis on minerals and contributed to the minerals section of the RMP. He has been with BLM for one year.

Dave Peters, Regional Economist. BA Economics/Business Administration, Chapman College. He wrote the economics sections. He has been with the BLM for 10 years.

James Hetzer, Writer/Editor. BA Journalism, University of Colorado. He wrote portions and edited the RMP. He has been with BLM for five years.

Rebecca Holzheimer, Cartographic Technician. Graduated Simms (MT) High School. She prepared the allotment overlay for the RMP. She has been with BLM for five years.

Barbara Hamburg, Word Processor Operator. Graduated Savage (MT) High School and Modern Business College, Missoula, Montana. She was responsible for the copy word processing. She has been with BLM for two years.

District Review

The Miles City District Division of Lands and Renewable Resources and the Planning and Environmental Assistance staff provided technical review of the RMP.

Montana State Office Support

The Division of Lands and Renewable Resources and the Division of Mineral Resources staffs provided assistance in preparation and review of the RMP during development.

The Printing and Graphics Branch provided mapping, art, typesetting and printing support.

Little Bluestem

APPENDICES

APPENDIX A: NO GRAZING ALTERNATIVE AND ENVIRONMENTAL CONSEQUENCES

Description of the Alternative

No livestock would be permitted to graze on public lands under this alternative. The analysis of this alternative provides a basis of comparison for the environmental, social and economic consequences of the other alternatives. All current grazing privileges would be revoked.

In the short and long term, vegetation provided to watershed and wildlife forage and cover would be 189,881 AUMs (a 73,778 AUM increase) over the present level.

No range improvements would be built or maintained unless the improvements were considered necessary for resource programs such as watershed or wildlife. Salvage rights would be granted or cash reimbursement made to ranchers who had contributed to range improvement facilities.

The four existing AMPs would be dropped and activity plans for wildlife would be developed on a site specific or areawide basis as needs are identified.

This program would eliminate the current permitted livestock use of 73,778 AUMs. In the "worst case" situation, BLM would require fencing of public lands to prevent livestock trespass. There would be approximately 2,500 miles of fences necessary for this undertaking, costing the private landowners $7,000,000, according to 1984 cost estimates.

The management of wildlife habitat would continue at the current level. This consists of monitoring the condition of sites known to be of high value to wildlife and protecting wildlife habitat in the development and implementation of activity plans.

Environmental Consequences

Soils

Elimination of livestock grazing on public lands would bring about an immediate increase in vegetation residue and carryover, providing

more cover and litter to the soil surface. An increase in soil productivity and development would occur, with an increase in levels of organic matter and increased soil moisture.

Hydrology

Water quality on public land would improve with the elimination of livestock grazing. Increased vegetation production on floodplain and riparian zones would result in lowered runoff and erosion. Reduced runoff would lower fecal bacteria, suspended sediment and nutrient loading of water sources. Increased riparian vegetation would improve stream channel stability and reduce erosion of stream banks and channels (Smeins 1975).

Vegetation

Eliminating livestock grazing would bring about a rapid improvement in plant vigor and vegetation cover. Ecological range condition would improve in the long term as succession to ecological climax progressed with the more hardy grazing-resistant plant species giving way to less hardy "climax" species.

Some range sites would improve very slowly, but eventually would approach climax. Only those ranges in excellent condition now would not show marked improvement and even these would improve within that class.

Without the stimulation of grazing, plant vigor and production would level off and stagnate on most soils in the long term.

About 2,500 miles of fences would be needed to exclude livestock from public lands. Impacts common to construction and maintenance of fences to include construction of roads and trails would result. Livestock trailing along the fences could impact private and state lands, assuming ranchers continue to graze livestock on their lands.

Livestock

The elimination of livestock grazing on public land would cause a loss of 73,778 AUMs.

The loss of grazing would reduce animal productivity on private and state lands, too, as livestock would have to trail to make use of the scattered private and state holdings. Livestock would be excluded from water, forage and shade areas on public lands and would trail along fence lines.

Wildlife

Vegetation availability of 189,881 AUMs in the short and long term for rangeland maintenance, wildlife forage and cover would be very beneficial to wildlife. The removal of livestock would result in an increase in residual vegetation available as food and cover for wildlife species.

In the short term, the quality and quantity of forage, especially forbs and browse, would improve; deer, antelope, and game birds would benefit. Upland game birds require residual vegetation for nesting and winter survival. Additional residual vegetation and greater vegetative production would help upland nesting waterfowl. Residual vegetation for nesting and brood rearing would be available near reservoirs. The quality and quantity of nongame forage and cover would increase.

In the long term, with the absence of livestock grazing, vegetation would trend toward a climax vegetation which is less desirable habitat for some wildlife species. Without cattle, periodic vegetative manipulations by fire, mechanical, chemical and/or other types of treatments could become necessary as a substitute for maintaining the suitability of some areas for big game. Therefore, cattle are important in maintaining the vegetation used by big game.

Riparian and woody draw habitats would improve in the absence of livestock grazing. However, vegetative manipulation by other than livestock grazing would be periodically necessary, as discussed above.

Development of activity plans for wildlife would be a major benefit to the BLM's wildlife management program because those plans would provide for consistent management policies in specific areas and not be concerned with livestock use.

Maintaining all water developments that are important for wildlife watering and maintaining reservoirs and pits that provide wetland habitat for waterfowl would have significant beneficial impacts on wildlife.

The 2,500 miles of fence constructed to isolate the federal land would be a significant barrier to big game movement in wintering and concentration areas.

Lands

Opportunities for land transactions would be significantly improved since the duration of a grazing lease and private investments for range improvements on federal land would not have to be considered or compensated. In addition, the prohibition on grazing the public lands could be a motivating factor for increased land sales and exchanges with area ranchers.

Cultural Resources

There would be no impacts on cultural resources.

Forestry

There would be no impacts on the forest resource.

Paleontology

There would be no impacts on the paleontologic resources.

Recreation

There would be no impacts from new range improvements or maintaining the woody riparian areas.

Fencing of public land would help to eliminate many of the landowner-hunter conflicts over boundary recognition.

No grazing would have a significant positive impact on recreation by increasing wildlife numbers and improving hunting opportunities.

Minerals

There would be no impacts on the minerals resource.

Economics

The loss to the livestock industry from the loss of grazing on public lands would be $2.4 million per year (73,778 AUMs/12 months x $400 value per AU = $2,459,267). This loss of revenue would affect all other sectors of the economy in the Resource Area.

If ranchers cut their livestock use by 73,778 AUMs, the counties would have a reduction in tax revenues which could lead to increased taxes.

Many ranches raise adequate hay to support their present herds through the winter. With a reduction in herd sizes, the demand for hay could decrease, which could lower the price received for hay.

Because of the increase in AUMs provided to rangeland and watershed maintenance, wildlife forage and cover, wildlife numbers would increase, current high big game populations do economically impact many ranchers. Damage by increased numbers of wildlife would cause ranchers some problems.

To fully protect themselves from trespass proceedings, $7,000,000 would need to be expended by ranchers for 2,500 miles of fence. This fencing could interfere with ranch management.

The BLM would have to increase budgets to support the administrative workload which would drastically increase because of livestock trespass abatement.

Social Conditions

Impacts resulting from a no grazing alternative would be significant and adverse in both the short and long terms with 100% of the area permit or lease holders affected by complete loss of BLM grazing privileges. If a rancher could not afford to purchase hay or to reduce herd sizes and still maintain a viable operation, he might eventually have to quit the livestock business. Impacts from loss of access to public grazing lands would be most adverse to small operators and to people just starting out in the ranching business, as many of them are barely managing to keep pace with inflation and rising interest costs as it is. For many of them, reduction in personal income and an accompanying drop in their overall sense of security could be expected to result. With one or two years of bad weather, negative impacts from loss of public forage would be magnified.

Besides losing the business, he and has family would also suffer many intangible losses, such as loss of the opportunity to live a preferred lifestyle, loss of ancestral ties to the lands and possibly the breakup of extended families and close circles of friends. Income reduction could also force operators and their families to seek off-ranch employment. For those ranchers who are advancing in age or who live 40 to 50 miles from the nearest town, however, the prospects of competing in a larger job market would be dim.

For those ranchers with very limited dependence on federal lands, the loss of access to public land would likely create more of an inconvenience than it would a financial hardship. However, because of the dispersed pattern in which parcels of public land occur throughout their private holdings, these ranchers anticipated having to deal with the frustration of seeing their own holdings cut in half or broken up by fences, meaning some alteration of traditional management patterns would have to be made.

APPENDIX B: PART 1

SUMMARY OF "M" AND "I" ALLOTMENT CONDITIONS, USE, CATEGORY, AND ALTERNATIVES

Rec.	Allot.	Condition-Public Land(Acres)				Acres		% Public	Stock		Season			Grazing	Produc.	Initial Cate-	Alt. A		Alt. B		Alt. C		Alt. D		Preferred		
No.	No.	E	G	F	N	Public	Other	Land	No.	CL	In	Out	AUMs	Pref.	Est.	gory	St	Lt	St	Lt	St	Lt	St	Lt	Alt	St	Lt
8002	2700	1486			234	1720	12200	12	2500	S	03 01	02 28	521	521	601	M	521	521	521	601	521	782	521	757	A	521	521
8003	2304		1408		192	1600	5120	19	900	Y	04 01	10 31	473	473	417	M	473	473	473	417	473	461	473	461	C	473	461
8006	2301		1377		5	1382	9280	13	200	C	03 01	02 28	253	429	456	M	429	429	429	456	429	1006	429	1006	A	429	429
									700	S	03 01	02 28	176														
8007	2401		3773		667	4440	17000	21	2500	S	03 01	02 28	1246	1246	976	M	1246	1246	1246	976	1246	976	1246	976	C	1246	976
8008	2703		764		112	876	4184	17	168	C	06 01	11 30	244	244	269	M	244	244	244	269	244	573	244	573	C	244	573
8018	2402			1257	125	1382	3120	31	1100	S	03 01	02 28	328	328	210	M	328	328	328	321	328	321	328	321	C	328	321
8021	2302		4006		498	4504	5963	43	1500	S	03 01	02 28	1408	1408	1193	M	1408	1408	1408	1193	1408	2242	1408	2103	C	1408	2242
8025	2501		2745		47	2790	*	*	180	C	05 15	10 15	900	*	1038	M	900	900	900	1038	900	2220	900	2220	A	900	900
8027	2205		1008		192	1200	2480	33	75	C	07 01	10 31	206	206	313	M	206	206	206	313	206	357	206	330	C	206	357
8031	2403		3532		1224	4756	22000	18	900	S	03 01	02 28	1346	1346	1014	M	1346	1346	1346	1014	1346	1151	1346	1094	C	1346	1151
8038	2206		579	3087	838	4504	13910	24	1100	C	03 01	02 28	1204	1204	877	I	1204	1204	1204	1227	1204	2154	1204	1809	D	1204	1809
8039	2723	1385	1247		71	2703	13138	17	500	C	03 01	02 28	820	820	901	M	820	820	820	901	820	1064	820	1064	A	820	820
8049	2404			3677	923	4600	16955	21	2700	S	03 01	02 28	1105	1105	666	I	1105	1105	1105	1061	1105	1154	1105	1009	C	1105	1154
8056	2460		4635		739	5374	3997	57	375	C	03 01	02 28	983	1489	1489	M	1489	1489	1489	1489	1489	1539	1489	1458	C	1489	1539
									400	S	03 01	02 28	506														
8063	2410			2407	73	2480	6880	26	500	C	03 01	02 28	612	612	451	M	612	612	612	710	612	1212	612	1207	C	612	1212
	2420			749	232	981	2200	31	200	Y	03 01	04 30	79	237	82	M	237	237	237	124	237	124	237	124	C	237	124
											11 01	02 28	158														
8064	2407		8469		1997	7966	8640	48	2000	Y	05 01	08 31	2549	3216	3164	M	3216	3216	3216	3164	3216	3214	3216	3109	A	3216	3216
	2455					2500	1600	61	2000	Y	04 01	04 30	444														
											09 01	09 15	223														
8071	2470			1592	368	1960	12120	14	300	C	03 01	02 28	404	404	196	M	404	404	404	315	404	315	404	315	C	404	315
8074	2310		1565		676	2241	9647	19	750	C	05 01	10 01	708	708	476	M	708	708	708	476	708	730	708	375	C	708	730
	2411		1442		198	1640	9620	15	475	C	05 01	10 31	516	516	360	M	516	516	516	360	516	360	516	357	C	516	360
8078	2749		910		130	1040	3773	22	200	C	03 01	02 28	316	316	308	M	316	316	316	308	316	308	316	308	A	316	316
8096	2413			572	165	737	862	46	900	S	05 16	10 15	181	181	116	I	181	181	181	175	181	180	181	172	C	181	180
8099	2763		592		128	720	1811	28	75	C	05 01	09 30	90	90	215	M	90	90	90	215	90	219	90	219	C	90	219
8108	2416		674		46	720	3840	16	700	S	03 01	02 28	163	163	197	M	163	163	163	197	163	257	163	255	C	163	257
8113	2771	1614			602	2216	17520	11	700	C	03 01	02 28	138	253	757	M	253	253	253	757	253	780	253	715	C	253	780
									1100	S	03 01	02 28	115														
8122	2780	1361			590	1951	11640	14	175	C	03 01	05 31	231	462	598	M	462	462	462	598	462	1296	462	1267	C	462	1296
											12 01	02 28	231														
8131	2417		7576		2206	2406	7940	23	2145	S	05 01	10 30	2465	2465	2115	M	2465	2465	2465	2115	2465	2145	2465	2088	C	2465	2145
	2429					7376	4264	63	2420	S	05 01	10 30															

Rec.	Allot.	Condition-Public Land(Acres)				Acres		% Public	Stock		Season			Grazing	Produc.	Initial Cate-	Alt. A		Alt. B		Alt. C		Alt. D		Preferred		
No.	No.	E	G	F	N	Public	Other	Land	No.	CL	In	Out	AUMs	Pref.	Est.	gory	St	Lt	St	Lt	St	Lt	St	Lt	Alt	St	Lt
8133	2791		947		53	1000	280	78	45	C	05 01	09 30	182	182	381	I	182	182	182	381	182	487	182	488	C	182	498
8136	2502		2790		141	2930	*	*	230	C	05 15	10 30	1265	*	1033	M	1000	1000	1000	1033	1000	2872	1000	2872	A	1000	1000
8138	2419	718			2	720	2640	21	35	C	03 01	02 28	178	178	262	M	178	178	178	262	178	262	178	262	C	178	262
8140	2213		462	34	34	530	1023	34	100	C	05 01	01 31	170	170	154	M	170	170	170	158	170	193	170	180	A	170	170
8141	2421			946	338	1284	1730	43	190	C	05 01	10 31	272	272	175	M	272	272	272	269	272	275	272	250	C	272	275
8146	2214		3221	491	1199	4911	16673	29	2020	C	03 01	02 28	1478	1478	1127	I	1478	1478	1478	1178	1478	1377	1478	1335	C	1478	1377
8152	2425			1191	49	1240	3148	28	300	S	03 01	02 28	351	351	220	M	351	351	351	350	351	533	351	533	C	351	533
8155	2440			653	102	755	1197	39	200	C	05 01	10 30	351	351	107	M	351	351	351	161	351	161	351	160	C	351	161
8160	2430			3555	599	4154	13860	23	250	C	06 01	09 30	1018	1018	680	M	1018	1018	1018	1027	1018	1217	1018	1067	C	1018	1217
8164	2311		880			880	1440	38	100	C	06 01	11 30	188	188	256	M	188	188	188	256	188	412	188	403	C	188	412
8171	2215		1538	305	253	2096	4131	34	99	C	09 01	02 28	594	699	536	M	699	699	699	579	699	636	699	636	C	699	636
									100	C	03 01	03 31	105														
8177	2432		1530		400	1930	6720	22	302	C	03 01	02 28	449	449	268	M	449	449	449	268	449	277	449	260	C	449	277
8200	2433		1968		463	2431	9593	20	200	C	03 01	02 28	505	505	317	M	505	505	505	317	505	353	505	303	C	505	353
8210	1740		970		210	1180	8100	13	1150	S	03 01	02 28	351	351	281	M	351	351	351	281	351	339	358	263	C	351	339
8220	2435		15399		4470	19869	21676	48	1835	C	05 16	10 31	4768	4768	4408	M	4768	4768	4768	4408	4768	4761	4768	4604	D	4768	4604
8225	1756		2190		269	2459	9570	20	700	C	03 01	02 28	796	796	793	M	796	796	796	793	796	824	796	824	A	796	796
8228	2218	597	1671	1253	397	3918	12000	25	421	C	03 01	02 28	1263	1263	1078	I	1263	1263	1263	1214	1263	2022	1263	1513	D	1263	1513
8230	1759		1210		43	1253	9600	12	900	C	03 01	02 28	439	439	438	M	439	439	439	438	439	454	439	454	A	439	439
8252	7213			547	93	640	4890	12	250	C	05 20	11 01	80	80	163	I	80	80	80	245	80	387	80	385	C	80	387
8259	2220	212	913	329	158	1612	5641	22	125	C	10 01	02 28	546	546	428	M	546	546	546	481	546	536	546	536	C	546	536
8260	2438		1015		1968	2983	17933	14	3000	Y	04 01	10 31	680	680	307	M	680	680	680	307	680	388	680	380	C	680	388
8261	2439			639	206	845	760	53	400	S	05 01	10 31	143	143	118	M	143	143	143	180	143	250	143	250	C	143	250
8274	2491			947	49	996	1040	49	210	S	05 01	10 31	252	252	170	M	252	252	252	255	252	255	252	255	C	252	255
8275	1794	869			331	1200	3200	27	200	C	05 01	10 31	311	311	393	M	311	311	311	393	311	566	311	556	A	311	311
8287	2443			1564	104	1668	9959	14	1550	S	05 01	10 31	491	491	278	I	491	491	491	418	491	418	491	418	C	491	418
8290	2444			1503	246	1749	4377	29	800	S	05 15	10 15	478	478	276	I	478	478	478	442	478	442	478	432	C	478	442
8295	2223		500	489	137	1126	2766	29	150	C	06 01	10 31	236	236	261	I	236	236	236	314	236	540	236	540	C	236	540
8299	2446			1233	114	1347	8520	14	1800	S	03 01	02 28	370	370	228	M	370	370	370	359	370	426	370	355	C	370	426
8302	2224		276	334	18	628	3080	17	150	C	03 01	02 28	222	222	160	I	222	222	222	224	222	351	222	276	D	222	276
8311	7221		1136		137	1273	6000	18	300	C	06 16	10 15	409	409	407	M	409	409	409	407	409	448	409	448	A	409	409
8312	7222		747		53	800	6000	12	300	Y	03 01	02 28	266	266	268	M	266	266	266	268	266	289	266	288	A	266	266
8322	2306		2075		195	2270	6440	26	800	S	05 01	10 30	588	588	619	M	588	588	588	619	588	1233	588	1179	C	588	1233
8331	7235		1109		72	1181	5044	19	80	C	03 01	02 28	95	380	327	M	380	380	380	327	380	512	380	342	C	380	512
									425	Y	03 01	02 28	285														
8341	2225		432		48	480	6000	7	75	C	05 01	01 31	172	172	135	M	172	172	172	135	172	136	172	136	A	172	172

Rec. No.	Allot. No.	Condition-Public Land(Acres) E	G	F	N	Acres Public	Other	% Public Land	Stock No.	CL	Season In	Out	AUMs	Grazing Pref.	Produc. Est.	Initial Cate-gory	Alt. A St	Lt	Alt. B St	Lt	Alt. C St	Lt	Alt. D St	Lt	Preferred Alt	St	Lt
8344	2448		6689		1291	7980	7006	53	1396	Y	05 15	09 15	1969	1969	2226	M	1969	1969	1969	2226	1969	2503	1969	2200	D	1969	2200
8349	2226		722	29	70	821	3600	19	65	C	03 01	02 28	259	259	239	M	259	259	259	240	259	366	259	284	D	259	284
8353	7253		960			960	12200	7	2800	S	05 01	10 31	190	190	269	M	190	190	190	269	190	316	190	251	A	190	190
8355	2308			396	4	400	1400	22	150	C	05 01	09 31	126	126	86	I	126	126	126	129	126	403	126	403	C	126	403
8356	7252		442		78	520	1467	26	40	C	04 01	09 31	82	82	173	M	82	82	82	173	82	173	82	173	C	82	173
8357	2309		679		1	680	2491	21	100	C	06 01	09 30	210	210	222	M	210	210	210	222	220	546	220	475	A	210	210
8373	7268	58	387	2004	785	3234	15271	17	1050	C	05 15	10 15	1045	1045	630	I	1045	1045	1045	868	1045	1433	1045	832	D	1045	832
TOTAL		8300	99145	31783	28458	167686							45305	43405	40352		45305	45305	45305	42934	45305	57512	45305	53493		45305	50367

*This is for the Ft. Meade Recreation Area; this area is leased for grazing on a bid basis, there is no perference.

Legend - Appendix B: Part 1

Condition:
E - Excellent; G - Good; F - Fair; N - Not for livestock grazing
These are areas not conditionable, eg., rock outcrop, barren areas and water
(Source for condition: BLM inventory and SCS consultation)

Other Acres: Privately controlled land
Stock CL: Class of Stock; C=cows; S=sheep; Y=yearlings

Production Estimate: An estimate of the current public land production based on present range condition.

ST: Short Term; Grazing preference.

LT: Long Term; Estimated production or allocation at the end of the implementation period.

Preferred Alternative: Preferred alternative for allotment management.

APPENDIX B: Part 2

SUMMARY OF "C" ALLOTMENT SIZE AND USE

Record No.	Allotment No.	Public Acres	Other Acres	Stock No.	Stock CL	Season In	Season Out	AUMs	Grazing Pref.
8000	2431	97	1700	250	C	03 01	02 28	26	26
	7262	37	1400	110	C	03 01	02 28	13	13
8005	2702	40	10796	800	Y	06 01	11 01	8	8
8009	2704	20	4250	750	S	05 01	09 30	247	247
8010	2705	20	2440	12	C	06 01	10 31	63	63
8011	2706	655	37450	3200	C	05 01	12 31	208	208
8012	2707	40	5280	200	C	03 01	02 28	11	11
8013	2201	1170	7790	300	C	03 01	02 28	371	371
	2754	360	1880	300	C	03 01	02 28	125	125
8014	2601	15	0	2	C	06 15	09 15	3	3
8015	2708	40	6360	1150	S	03 01	02 28	13	13
8016	2709	400	2800	750	C	03 01	02 28	120	120
	2710	630	14500	1000	C	03 01	02 28	191	191
	7304	128	0	300	C	03 01	02 28	32	32
8017	7265	119	10800	2000	Y	05 01	10 31	20	20
8019	2718	719	4500	200	C	03 01	02 28	215	215
8020	2202	47	600	55	C	03 01	02 28	14	14
8022	2204	351	3640	100	C	03 01	02 28	111	111
8024	2711	79	637	50	C	03 01	02 28	24	24
8026	2712	80	5000	800	C	03 01	02 28	27	27
8028	2713	21	0	280	C	03 01	02 28	7	7
8029	2714	320	23400	2500	S	03 01	02 28	88	88
8030	1703	608	9600	2000	S	04 01	09 30	203	203
8032	7214	120	1069	75	C	03 01	03 31	3	11
						12 01	02 28	8	
8033	2715	516	11460	220	C	05 01	09 30	154	154
8034	2717	654	10300	350	C	05 01	11 01	197	197
8035	2721	880	2760	130	C	03 01	02 28	150	150
8036	2719	515	10910	300	C	03 29	02 28	153	153
8037	2722	40	4980	150	C	03 01	02 28	12	12
8040	2724	240	14535	300	C	05 01	09 30	58	58
8041	2726	703	5098	200	C	03 01	02 28	266	266
8043	2727	600	16640	420	C	05 01	10 31	203	203
8045	2730	734	5600	300	C	03 01	02 28	247	247
8046	2728	40	9040	400	S	03 01	02 28	12	12
8047	2729	80	1920	300	S	05 01	10 01	18	18
8048	2731	60	2840	100	C	05 01	10 01	8	8
8050	2732	40	8320	200	C	05 16	09 15	12	12
8051	2405	840	4809	1100	S	03 01	02 28	209	209
8052	7228	160	2240	95	C	04 01	05 30	20	20
						08 01	11 30	20	
8053	2734	80	3818	100	C	05 01	11 30	28	28
8054	2406	480	6920	500	S	05 01	09 30	130	120
8055	2733	855	8000	700	C	05 15	10 14	161	161
8057	2303	520	2645	85	C	06 01	10 15	75	179
				155	Y	06 01	10 15	104	
8058	2737	457	7000	250	C	03 01	02 28	148	148
8059	2736	40	18000	600	C	03 01	02 28	335	335
8060	2738	40	2950	300	S	04 01	09 30	13	13
8061	2207	720	8500	350	C	05 01	10 31	203	203
8062	2739	110	4500	75	C	03 01	02 28	18	18
8063	2441	120	2320	500	C	03 01	02 28	36	36
8065	2408	519	8100	350	C	03 01	02 28	177	177
8066	2806	80	640	11	C	05 01	11 01	25	25
8067	2741	440	11000	500	S	03 01	03 31	20	100
						11 01	02 28	80	
8068	7259	399	40400	2600	C	06 01	11 15	119	119
8069	2409	2935	22000	800	S	03 01	02 28	790	790
8070	2743	40	2420	450	S	03 01	02 28	11	11
8072	2744	240	9280	800	S	05 01	11 01	70	70
8073	2746	40	0	250	C	05 15	08 31	10	10
8074	1757	280	2120	2000	C	05 01	10 31	87	87
8075	2745	1316	18200	4700	S	05 01	09 31	384	384

APPENDIX B: Part 2

SUMMARY OF "C" ALLOTMENT SIZE AND USE

Record No.	Allotment No.	Public Acres	Other Acres	Stock No.	Stock CL	Season In	Season Out	AUMs	Grazing Pref.
8076	2747	77	0	200	C	03 01	02 28	23	23
8077	2748	360	240	150	S	05 01	10 01	90	90
8080	2751	1151	5600	1200	S	05 01	09 30	351	351
8081	2752	240	3960	400	Y	05 01	10 31	78	78
8082	2753	650	14000	200	C	03 01	02 28	223	223
8083	2208	40	1836	150	C	05 01	10 31	13	13
8086	7260	274	4563	170	C	03 01	02 28	77	77
8087	2755	600	5400	600	S	03 01	02 28	166	166
8089	2756	209	7400	165	C	07 01	09 30	38	58
				200	S	03 01	02 28	20	
8090	2604	143	0	10	C	06 01	09 30	40	40
	2630	693	0	39	C	06 01	09 30	156	156
8091	2759	160	7000	500	C	10 01	02 28	53	53
8092	2758	160	0	300	C	05 01	10 31	53	53
8093	2760	315	4440	175	C	03 01	02 28	108	108
8094	2761	80	4400	150	C	03 01	02 28	17	17
8095	2209	520	1360	125	C	05 01	10 31	104	104
8097	2762	561	12640	250	C	03 01	02 28	118	118
8098	2414	959	12840	1900	S	03 01	02 28	293	293
8100	2764	200	1370	100	C	06 01	10 31	67	67
8101	2211	680	4760	190	C	03 01	02 28	222	222
8102	2453	800	5300	100	C	05 01	11 01	240	240
8103	2605	9	0	2	H	06 01	09 30	2	2
8104	2415	75	3280	200	C	05 01	09 30	20	20
8105	2765	40	4960	700	S	03 01	02 28	11	11
8106	2766	80	3280	150	C	06 01	11 01	27	27
8107	2767	320	26000	300	C	03 01	03 31	18	72
				450	C	12 01	02 28	54	
8109	2212	120	1480	200	C	03 01	02 28	32	32
8110	2769	440	7820	150	C	05 01	11 30	140	140
8111	2768	982	13078	200	C	03 01	02 28	290	290
8112	2770	280	3600	100	C	03 01	02 28	81	81
8115	2773	161	0	25	C	03 01	02 28	55	55
8116	2774	80	1000	300	S	05 05	09 06	24	24
8117	2775	200	5640	110	C	03 01	02 28	30	30
8118	2776	660	2792	200	C	05 01	10 31	186	186
8119	2777	160	640	190	C	05 01	10 31	48	48
8120	2778	320	14560	600	C	05 01	10 31	102	92
8121	2779	398	4840	120	C	03 01	12 31	113	113
8123	2781	209	9800	250	C	03 15	06 01	74	74
8124	2782	153	1870	225	C	05 15	10 15	20	20
8125	2783	240	1637	70	C	03 01	02 28	48	48
8126	2785	279	5600	300	C	03 01	02 28	51	51
8127	2786	80	680	50	C	03 01	02 28	12	12
8128	2787	80	1640	52	C	03 01	02 28	26	26
8129	2788	40	627	125	C	03 01	04 31	5	9
						11 01	02 28	4	
8130	2789	473	3873	100	C	03 01	03 31	24	139
						10 01	02 28	115	
8132	1708	40	4608	400	C	05 01	11 01	12	12
	2418	470	4228	200	C	05 01	11 31	116	116
8133	7314	40	2520	200	C	05 01	11 01	8	8
8134	2790	160	4700	800	S	03 01	02 28	49	49
8135	2792	160	7640	100	C	03 01	03 31	7	43
				175	C	10 15	02 28	36	

APPENDIX B: Part 2

SUMMARY OF "C" ALLOTMENT SIZE AND USE

Record No.	Allotment No.	Public Acres	Other Acres	Stock		Season		AUMs	Grazing Pref.
				No.	CL	In	Out		
8137	2793	640	10532	75	C	03 01	02 28	56	56
8142	2794	80	7202	200	C	03 01	02 28	24	24
8143	2795	259	5500	350	C	03 01	02 28	64	64
8144	2422	650	5634	1200	S	03 01	02 28	186	186
8145	2796	360	4140	50	C	03 01	03 31	12	121
						06 01	02 28	109	
8147	2423	80	640	200	C	03 01	02 28	24	24
8148	2797	80	4139	165	C	03 01	02 28	27	27
8149	2798	400	5350	180	C	05 15	10 14	130	130
8150	1701	280	3970	350	C	03 01	02 28	87	87
8153	2426	720	2400	300	S	03 01	02 28	203	203
8154	1702	1412	16180	2300	S	03 01	02 28	230	230
8155	2424	981	5766	400	C	05 01	10 30	306	306
	2450	723	2837	250	C	05 01	10 30	225	225
8156	2427	200	14000	800	S	05 01	12 01	73	73
8157	1705	40	3160	125	C	03 01	02 28	14	14
8158	1704	916	18000	200	C	03 01	02 28	230	230
8159	1707	76	4360	320	C	03 01	04 20	19	19
8161	1706	160	3220	150	C	03 01	02 28	44	44
8162	2428	580	2080	750	S	03 01	02 28	107	107
	7275	40	1280	750	S	05 01	10 30	10	10
8163	7324	125	5295	150	C	03 01	02 28	36	36
8165	1709	571	8000	500	C	03 01	12 18	203	203
8166	2607	10	0	1	C	06 01	08 30	3	3
	2608	10	0	20	C	06 01	08 30	3	3
8168	7200	40	2360	100	C	03 01	02 28	5	5
8169	1710	80	1970	200	S	03 01	02 28	22	22
8170	1775	40	0	30	C	03 01	02 28	3	3
8172	1711	200	7500	200	C	03 01	02 28	53	53
8173	1712	80	5640	1000	S	05 01	08 31	22	22
8174	1713	240	11346	800	S	03 01	02 28	56	56
8175	1714	480	1840	80	C	05 16	10 15	160	160
8176	1715	160	2070	100	C	03 01	02 28	44	44
8178	2478	280	2160	125	C	06 01	11 30	34	79
				250	Y	06 01	11 30	45	79
8179	1769	40	400	100	C	03 01	02 28	7	7
8180	1716	200	5480	300	C	03 01	02 28	50	50
8181	1720	196	4670	450	S	05 15	09 15	74	74
8182	1723	40	8800	1200	C	04 01	02 28	22	11
8183	1717	40	7200	400	C	03 01	02 28	12	12
8184	7266	128	3000	110	C	05 01	11 30	20	20
8185	1719	80	5240	200	C	05 01	10 31	27	27
8186	1721	120	6540	250	C	06 01	10 30	41	41
8187	1722	440	5642	1000	S	03 01	03 31	19	152
						06 01	09 30	76	
						12 01	02 28	57	
8188	1724	80	2400	150	C	06 15	09 15	26	26
8189	1725	560	5200	600	C	03 01	02 28	167	167
8190	1727	160	1600	200	C	05 16	10 15	48	48
8191	1728	222	7474	125	C	06 01	10 30	46	47
8192	1729	232	3800	390	C	03 01	02 28	73	73
	1746	234	6320	6	C	11 01	02 28	24	42
				160	C	03 01	05 31	18	
8193	1726	23	10500	830	C	05 01	10 31	8	8
8194	7249	60	971	200	S	03 01	02 28	9	9
8195	1730	40	2840	200	C	03 01	02 28	11	11
8196	1731	787	11710	1500	C	02 28	03 01	247	247
8197	1732	279	4900	200	C	03 01	02 28	83	83
8198	1733	40	2912	125	C	05 01	09 30	14	14
8199	2610	357	875	46	C	06 01	11 15	40	40
8202	1734	335	2683	75	C	05 15	11 15	83	83
8203	2216	1040	4800	400	C	03 01	02 28	377	377

APPENDIX B: Part 2

SUMMARY OF "C" ALLOTMENT SIZE AND USE

Record No.	Allotment No.	Public Acres	Other Acres	Stock		Season		AUMs	Grazing Pref.
				No.	CL	In	Out		
8204	2434	960	3700	200	C	03 01	02 28	93	140
				500	S	03 01	02 28	47	
8205	1735	640	7280	200	C	03 01	02 28	230	230
8206	1736	600	17530	200	C	07 01	12 31	30	191
						08 01	12 31	161	
8207	1737	240	1880	165	C	03 01	02 28	69	69
8208	1738	40	1022	200	S	05 01	09 31	13	13
8209	1739	329	3800	200	C	05 01	11 30	115	115
8211	1741	280	3400	1000	C	03 01	02 28	37	73
				3000	S	03 01	02 28	36	
8212	1742	518	1800	800	C	03 01	02 28	126	126
8213	1743	200	3140	150	C	03 01	02 28	61	61
8214	1744	160	0	10	C	06 01	10 31	39	39
8215	1745	560	2500	500	C	03 01	02 28	138	138
8216	1747	160	1040	60	C	03 01	02 28	25	25
8217	1749	240	6500	200	C	05 25	10 31	75	75
8218	1751	160	3920	500	S	05 01	10 31	12	12
8219	1748	120	1135	70	C	07 01	12 31	29	29
8221	1750	520	0	24	C	03 01	02 28	144	144
8222	1752	120	3000	680	S	05 01	09 30	33	33
8223	2217	560	7300	125	C	03 01	04 31	61	173
				130	Y	11 01	02 28	112	
8224	1753	120	4044	400	C	03 01	02 28	39	39
8227	1754	80	640	225	C	09 01	11 30	27	27
8229	1755	440	20000	1000	S	03 01	02 28	143	143
8231	1760	240	6400	800	C	01 01	02 28	30	82
						03 01	06 30	52	82
8232	1762	40	1120	70	C	06 16	07 15	14	14
8233	2219	326	3100	150	C	03 01	02 28	84	84
8234	1758	360	2640	200	C	05 01	10 31	112	112
8235	1761	40	1000	40	C	03 01	02 28	13	13
8237	1763	1200	42740	3200	S	03 01	02 28	338	338
	1766	371	8260	150	C	03 01	02 28	95	95
8239	1764	360	8000	900	C	03 01	02 28	95	95
8240	1765	80	5900	2200	S	05 01	08 31	24	24
8241	1767	654	7520	200	C	05 01	10 31	189	189
8242	1768	40	8240	100	C	03 01	03 31	5	13
						11 01	02 28	8	
8243	1770	40	5150	600	C	05 01	10 31	14	14
8244	2451	196	8640	1250	S	03 01	02 28	69	69
8246	1771	52	680	110	C	06 01	10 31	17	17
8247	1773	120	9230	600	S	03 01	02 28	38	38
8248	1774	80	1800	72	C	06 01	08 15	26	26
8249	1777	280	2280	215	C	05 15	10 31	70	70
8250	1769	185	2400	275	Y	03 01	02 28	58	58
8251	2436	565	14120	2000	C	05 01	12 31	165	165
8253	1776	280	4320	390	C	03 01	02 28	48	48
8254	1778	240	1400	100	C	06 01	11 01	72	72
8255	1779	320	3840	200	C	06 01	10 31	114	114
8256	1780	360	4320	600	S	06 01	10 31	105	105
8257	1781	160	14960	100	C	03 01	04 30	26	26
						11 01	02 28	26	
8258	1782	80	8320	400	C	03 01	02 28	20	20
8262	1783	1201	7750	350	C	05 01	12 31	172	172
8263	1784	40	11240	500	C	03 01	02 28	12	12
8265	1718	80	720	15	C	05 01	09 01	10	10
8266	1790	320	1640	100	C	11 01	02 28	97	97
8267	1744	40	1119	180	C	05 15	09 30	12	12
8268	1787	104	7970	300	C	03 01	02 28	34	34
8269	1788	240	1060	71	C	06 01	11 30	76	76
8270	1789	120	920	100	C	05 01	12 31	19	19
8271	1791	120	2320	30	C	06 01	08 31	14	14

APPENDIX B: Part 2

SUMMARY OF "C" ALLOTMENT SIZE AND USE

Record No.	Allotment No.	Public Acres	Other Acres	Stock		Season		AUMs	Grazing Pref.
				No.	CL	In	Out		
8273	1792	240	3700	75	C	05 01	09 30	64	64
	1793	160	2860	75	C	05 01	09 30	51	51
8277	1795	240	2400	400	C	03 01	02 28	70	70
8278	2221	80	4000	255	C	03 01	02 28	25	25
8279	1797	80	3940	200	C	03 01	02 28	20	20
8280	1798	520	3600	150	C	03 01	02 28	124	124
8281	7210	80	8320	1000	C	05 01	09 01	26	26
	7263	881	3040	3000	Y	05 01	09 01	232	232
	7264	440	9625	1000	C	05 01	09 01	147	147
8282	7201	920	7384	2000	S	05 01	10 31	298	298
8283	1799	525	6220	150	C	05 15	10 15	166	166
8284	2222	480	7600	400	C	05 10	11 10	108	108
8286	2442	916	5560	300	C	03 01	02 28	205	205
8288	7204	240	7122	800	S	05 01	09 30	71	71
8289	7205	472	13600	1000	S	05 01	10 31	156	156
8290	2449	160	4480	100	C	03 01	02 28	44	44
	2452	80	3880	100	C	03 01	02 28	20	20
8291	7203	160	14500	300	C	03 01	04 30	20	53
						11 01	02 28	33	
8292	7206	592	10000	200	C	01 01	02 28	76	151
						03 01	04 01	75	
8293	7207	40	4200	60	C	06 15	10 01	10	10
8294	7208	160	1560	80	C	06 01	11 30	33	33
8296	1772	120	2640	160	C	03 01	02 28	38	38
8297	7209	37	5800	250	C	03 01	02 29	11	11
8298	2445	621	3715	400	S	05 01	10 30	172	172
8300	7212	521	2800	75	C	03 01	03 31	28	163
						10 01	02 28	135	
8301	7215	600	3400	150	C	05 01	09 30	129	129
8303	7211	80	1891	200	C	05 15	08 14	27	27
8304	7223	319	7600	125	C	11 01	12 31	100	100
8305	2305	200	2440	150	C	03 01	04 15	30	70
						11 15	02 28	40	
8306	2612	310	110	10	C	06 15	10 31	30	30
8307	2784	200	8070	200	C	06 01	09 01	72	72
8308	7216	80	1960	200	C	03 01	02 28	19	19
8309	7218	904	18971	430	C	03 01	02 28	234	234

APPENDIX B: PART 3
DETERMINATION OF ALTERNATIVE LONG-TERM VALUES

Grazing	Allot.	Grazing	Production	Alt.	Alt. B			Alt. C				Alt. D				Preferred Alternative				
Record	No.	Pref.	Estimate	A	Native	MT	TOTAL	Native	MT	TP	TOTAL	Native	MT	TP	TOTAL	Native	MT	TP	TOTAL	ALT1/
8002	----	521	601	521	601	--	601	523		259	782	521		236	757	521			521	A
8003	----	473	417	473	417	--	417	407		54	461	407		54	461	407		54	461	C
8006	----	429	456	429	456	--	456	270		736	1006	270		736	1006	429			429	A
8007	----	1246	976	1246	976	--	976	976	--	--	976	976			976	976			976	C
8008	----	244	269	244	269	--	269	190	--	383	573	190		383	573	190		383	573	C
8018	----	328	210	328	308	13	321	308	13	--	321	308	13		321	308	13	--	321	C
8021	----	1408	1193	1408	1193	--	1193	910		1332	2242	886		1217	2103	910		1332	2242	C
8025	----	900	1038	900	1038	--	1038	731		1489	2220	731		1489	2220	900			900	A
8027	----	206	313	206	313	--	313	302		55	357	302		28	330	302		55	357	C
8031	----	1346	1014	1346	1014	--	1014	978	--	173	1151	976		118	1094	978		173	1151	C
8038	----	1204	877	1204	1224	3	1227	990	3	1161	2154	966	3	840	1809	966	3	840	1809	D
8039	----	820	901	820	901		901	816		248	1064	816		248	1064	820	--	--	820	A
8049	----	1105	666	1105	936	125	1061	904	125	125	1154	884	125		1009	904	125	125	1154	C
8056	----	1489	1489	1489	1489	--	1489	1484		55	1539	1458			1458	1484	--	55	1539	C
8063	2410	612	451	612	641	69	710	511	69	632	1212	506	69	632	1207	511	69	632	1212	C
	2420	237	82	237	120	4	124	120	4		124	120	4		124	120	4	--	124	C
8064	----	3216	3164	3216	3164	--	3146	3146	--	68	3214	3106		3	3109	3216			3216	A
8071	----	404	196	404	275	40	315	275	40		315	275	40		315	275	40	--	315	C
8074	2310	708	476	708	476	--	476	386		344	730	375			375	386	--	344	730	C
	2411	516	360	516	360	--	360	360			360	357			357	360	--	--	360	C
8078	----	316	308	316	308	--	308	308			308	308			308	316			316	A
8096	----	181	116	181	173	2	175	171	2	7	180	163	2	7	172	171	2	7	180	C
8099	----	90	215	90	215	--	215	214		5	219	214		5	219	214	--	5	219	C
8108	----	163	197	163	197		197	183		74	257	183		72	255	183	--	74	257	C
8113	----	253	757	253	757		757	749		31	780	695		20	715	749	--	31	780	C
8122	----	462	598	462	598		598	413		883	1296	384		883	1267	413	--	883	1296	C
8131	----	2465	2115	2465	2115		2115	2104		41	2145	2088			2088	2104	--	41	2145	C
8133	2791	182	381	182	381		381	343		144	487	344		144	488	343	--	144	487	C
8136	----	1000	1033	1000	1033		1033	524		2348	2872	524		2348	2872	1000			1000	A
8138	----	178	262	178	262		262	262			262	262			262	262	--	--	262	C
8140	----	170	154	170	158		158	151		42	193	138		42	180	170			170	A
8141		272	175	272	257	12	269	255	12	8	275	238	12		250	255	12	8	275	C
8146		1478	1127	1478	1178		1178	1130		247	1377	1128		207	1335	1130	--	247	1377	C
8152	----	351	220	351	300	50	350	257	50	226	533	257	50	226	533	257	50	226	533	C
8155	2440	351	107	351	161	--	161	161			161	160			160	161	--	--	161	C
8160	----	1018	680	1018	1013	14	1027	956	14	247	1217	947	14	106	1067	956	14	247	1217	C

Grazing Record	Allot. No.	Grazing Pref.	Production Estimate	Alt. A	Alt. B Native	Alt. B MT	Alt. B TOTAL	Alt. C Native	Alt. C MT	Alt. C TP	Alt. C TOTAL	Alt. D Native	Alt. D MT	Alt. D TP	Alt. D TOTAL	Preferred Alternative Native	Preferred Alternative MT	Preferred Alternative TP	Preferred Alternative TOTAL	ALT1/
8164	----	188	256	188	256		256	215		197	412	206		197	403	215	--	197	412	C
8171	----	699	536	699	547	32	579	532	32	72	636	532	32	72	636	532	32	72	636	C
8177	----	449	268	449	268		268	268		9	277	260			260	268	--	9	277	C
8200	----	505	317	505	317		317	304		49	353	303			303	304	--	49	353	C
8210	----	351	281	351	281		281	266		73	339	263			263	266	--	73	339	C
8220	----	4768	4408	4768	4408		4408	4372		389	4761	4315	--	289	4604	4315	--	289	4604	D
8225	----	796	793	796	793		793	786		38	824	786		38	824	796			796	A
8228		1263	1078	1263	1200	14	1214	983	14	1025	2022	959	11	543	1513	959	11	543	1513	D
8230	----	439	438	439	438		438	430		24	454	430		24	454	439			439	A
8252	----	80	163	80	245		245	201		186	387	201		184	385	201	--	186	387	C
8259	----	546	428	546	421	60	481	409	60	67	536	409	60	67	536	409	60	67	536	C
8260	----	680	307	680	307		307	286		102	388	278		102	380	286	--	102	388	C
8261	----	143	118	143	174	6	180	158	6	86	250	158	6	86	250	158	6	86	250	C
8274	----	252	170	252	255	--	255	255			255	255			255	255	--	--	255	C
8275	----	311	393	311	393	--	393	357		209	566	356		200	556	311	--	--	311	A
8287	----	491	278	491	417	1	418	417	1		418	417	1		418	417	1	--	418	C
8290	2444	478	276	478	386	56	442	386	56		442	376	56		432	386	56	--	442	C
8295	----	236	261	236	314		314	272		268	540	272		268	540	272	--	268	540	C
8299	----	370	228	370	328	31	359	306	31	89	426	304	31	20	355	306	31	89	426	C
8302	----	222	160	222	131	93	224	103	93	155	351	84	93	99	276	84	93	99	276	D
8311	----	409	407	409	407	--	407	398		50	448	398		50	448	409			409	A
8312	----	266	268	266	268		268	254		35	289	253		35	288	266			266	A
8322	----	588	619	588	619		619	468		765	1233	432		747	1179	468	--	765	1233	C
8331	----	380	327	380	327		327	267		245	512	262		80	342	267	--	245	512	C
8341	----	172	135	172	135		135	134		2	136	134		2	136	172			172	A
8344	----	1969	2226	1969	2226		2226	2134		369	2503	2048		152	2200	2048	--	152	2200	D
8349	----	259	239	259	240		240	209		157	366	190		94	284	190	--	94	284	D
8353	----	190	269	190	269		269	253		63	316	251			251	190			190	A
8355	----	126	86	126	129		129	58		345	403	58		345	403	58	--	345	403	C
8356	----	82	173	82	173		173	173			173	173			173	173	--	--	173	C
8357	----	210	222	210	222		222	133		413	546	131		344	475	210	--	--	210	A
8373	----	1045	630	1045	856	12	868	692	12	729	1433	620	12	200	832	620	12	200	832	D
		45305	40352	45305	42297	637	42934	39247	637	17628	57512	38577	634	14282	53493	39897	634	9836	50367	

Legend - Appendix B: Part 3

1/ Alternative selected for each allotment under the Preferred Alternative.

Production Estimate: An estimate of the current production of the public lands based on present condition.
Native: Lands which would retain their natural character and not be mechanically manipulated.
MT = AUMs produced as a result of lands which are Mechanically Treated to resolve resource problems.
TP = AUMs produced on lands which are converted to Tame Pasture.

APPENDIX B: PART 4 METHODOLOGY OF VEGETATION APPROTIONMENTS AND COMPUTATIONS

The process used to develop the grazing capacity estimates in both the short and long term for M and I allotments is shown below.

Production estimates are based on soil capability and estimates of current range condition. The soils information was derived from the various soil surveys. Production values were developed from the appropriate SCS range technical guides.

Suitability of soils for mechanical treatment or conversion to tame pasture and the vegetation production which would result from those treatments was derived from the soil surveys and a review of the research literature cited below.

Rauz et al, 1962; Norman 1982; Houston and Urich 1972; Houston 1971; Valentine 1977; Kartchner et al, 1983; Wright et al, 1978; White et al, 1981; Fisser 1974; Neff and Wight 1977; Soiseth et al, 1974; Wight et al, 1978; Wight and Siddoway 1971; Nichols et al, 1969; Wight and White 1974; Ryerson et al, 1980; Neff and Wight 1980.

Alternative A

The short and long-term values are the current grazing preference except in the case of Fort Meade. The preferences were based on range surveys (Missouri River Basin Studies) done in the 1950's (BLM, 1952; BLM, 1954; BLM, 1957). The Fort Meade values are the present licensed use. Grazing authorization there is done on a bid basis and there is no preference.

Alternative B

The short-term value is the grazing preference as discussed for Alternative A.

The long-term values are estimates of production from native rangelands in good or better condition and from mechanically treated lands. Ranges currently in less than good condition would improve to good, and lands which are now in good or excellent condition would be maintained at that level.

Mechanical treatment of fair condition ranges capable of receiving such treatment would be done to resolve vegetation or soil problems which did not respond to grazing treatments in the short term. Production estimates were developed from soil survey data and research values as discussed previously.

Alternative C

The short-term value is the grazing preference as discussed for Alternative A.

The long-term value is the same as in Alternative B with the exception of lands converted to tame pasture. Those soils which could be converted to tame pasture would be treated without regard to range condition or response to grazing treatments. Production from this treatment was estimated using soil survey values.

Alternative D

The short-term value is the grazing preference as discussed for Alternative A.

The long-term values are the same as those in Alternative C, except that all vegetation in riparian zones was apportioned to resources or activities other than livestock.

Preferred Alternative

The short-term value is the grazing preference as discussed for Alternative A.

The long-term values are the same as those shown in the appropriate alternative. The method of development is as shown for that alternative.

APPENDIX B: PART 5 DERIVATION OF "OTHER" AUMS (WATERSHED AND WILDLIFE FORAGE AND COVER)

The use of the acronym AUM to describe vegetation apportioned to resources other than livestock was done to maintain consistency and a point of comparison. A conversion from AUM to pounds of vegetation is possible by multiplying by 800.

A review of SCS range technical guides shows that approximately 25 percent of the vegetation produced on a given site is apportioned to livestock on lands authorized for grazing. The apportionment percentage of each range site can be determined by applying the formula shown below. This formula generally accounts for inaccessible forage within a suitable site but would not normally be applied to areas not suitable for grazing because of the location or plant composition.

SP x % divided by MFR = ISR or ISR x MFR divided by SP = %

SP = Site production in pounds per acre

% = Percentage of apportionment to livestock

MFR = Monthly forage requirement per cow (800 pounds)

ISR = Initial stocking rate (AUMs per acre) from technical guide

APPENDIX C
ALTERNATIVES IMPLEMENTATION COSTS (15-YEAR PERIOD)

The cost of implementing each alternative is shown below. Cost items included are: (labor and materials); overhead (project implementation, design, administration). Cultural clearance costs are not included.

	ALTERNATIVES				
Construction and Overhead	**Preferred**	**A**	**B**	**C**	**D**
Fences — $2800/mi.	$ 84,000	$ 84,000	$ 84,000	$ 84,000	$ 84,000
Water sources (wells, pipelines, reservoirs/pits, springs) $3,500 ea.	$ 420,000	$ 420,000	$ 420,000	$ 420,000	$ 420,000
Mechanical treatment $20/acre	$ 33,260	$ 12,000	$ 33,320	$ 33,320	$ 33,260
Conversion to tame pasture $25/acre	$ 184,30	—	—	$ 202,875	$ 168,125
Noxious weed control $850/acre (Control requires 5 years x $170/acre = $850 acre total treatment cost)	as required	as required	as required	as required	as required
Prairie dog control $7/acre	as required	as required	as required	as required	as required
TOTAL	$ 721,560	$ 516,000	$ 537,320	$ 740,195	$ 705,385

Maintenance costs are included in these alternatives.

Fire treatments are not included in these alternatives.

APPENDIX D: OIL AND GAS LEASING, EXPLORATION AND OPERATION

Leasing

Oil and gas leases fall into two basic categories—competitive and noncompetitive. Competitive leases are issued in Known Geologic Structures (KGSs) which are areas known to contain producible oil and gas deposits. Noncompetitive leases are issued for lands outside KGSs and are available as a result of either simultaneous filings or open over-the-counter offers.

KGS land may be offered for competitive leasing based on economic production as ascertained by the Bureau. If this occurs, the BLM then prepares a report as to KGS status, determines whether competitive leasing is in the public interest, and groups tracts into lease parcels. If leasing is recommended, a competitive lease sale is scheduled. The BLM offers the parcels for lease through competitive sealed bids. The adequacy of the high bids tendered is determined by a bid evaluation team composed of representatives from BLM. Each sealed bid must be accompanied by an initial payment of 20% of the bonus offered; the remaining bonus payment must be paid prior to lease issuance.

On noncompetitive leases, the applicant files an offer to lease on lands open to lease in non-KGS areas. If, through adjudication, the lands are available for lease, the BLM District Office or other appropriate surface management agency responds with appropriate land use recommendations and, upon approval, a 10 year lease is issued to the applicant.

Previously leased parcels in non-KGS areas (i.e., simultaneous and noncompetitive filings) are listed monthly as they become available following expiration, cancellation, or termination of the old leases. Once a list of available parcels is approved and advertised, all applications received during the filing period are considered to have been filed simultaneously. An applicant may file only one application per tract, accompanied by a $75 filing fee and the first year's rental fee. A drawing is held and three applications are drawn for each parcel. A lease is offered on the parcel in the order in which they were drawn (i.e., a winner and two alternatives).

For simultaneous oil and gas parcels that receive no applications, these parcels go into an over-the-counter type of noncompetitive lease class. Any person may lease these parcels over-the-counter, as long as they meet the basic criteria and must pay the filing fee and the first year's rental.

All leases require rent payment in advance. Rent on leases issued over-the-counter is $1.00 per acre per year. Leases issued pursuant to a simultaneous filing rent for $1.00 per acre per year for the first 5 years and $3.00 per acre per year for each remaining year. For competitive leases, an annual rental of $2.00 per acre is charged. Upon economic production of oil and gas, the royalty charge varies from 12.5% to 25% value, depending on the production volume. Prior to drilling, the lease holder or designated operator must secure bond to ensure compliance with all terms of the lease. Rent and royalty schedules on competitive leases are described in the lease agreement.

The BLM has responsibility to assure full compliance with the spirit and objectives of the National Environmental Policy Act (NEPA) of 1969, the Federal Land Policy and Management Act (FLPMA) of 1976, other federal environmental legislation, and supporting Executive Orders and regulations concerning oil and gas development.

Duties prior to issuing leases include application of standard stipulations to cover most items necessary to protect and subsequently rehabilitate the surface resource. If additional stipulations are required, they are formulated and included prior to lease issuance.

After lease issuance and prior to approval of any surface disturbing activities within the area of the lease, a detailed site-specific review and field examination is conducted by BLM and any additional surface administering agency. From this effort, site-specific requirements are formulated for the protection of the surface resources and subsequent rehabilitation, and imposed upon the lessee prior to approval of the proposed activity (i.e., geophysical work, well drilling). Although BLM has prime responsibility at this point, it must have full concurrence from any other surface managing agency. If differences exist, these are forwarded through various administrative levels and eventually to the Secretary.

Exploration

The regulatory authority for seismic activities is outlined in 43 CFR 3045 (1983). To better under-stand oil and gas leasing operations, the following discussion describes the operator's and BLM's responsibilities in each phase of the operation:

> The geophysical operator has a responsibility to cooperate and coordinate his operation with the District Manager. The operator's responsibilities are to:
>
> 1. First, be bonded.
>
> 2. File a Notice of Intent to Conduct Oil and Gas Exploration Operations on unleased lands, with maps showing proposed seismic lines.
>
> 3. Comply with rules, regulations and District policies.
>
> 4. File a Notice of Completion accompanied by appropriate maps.
>
> The BLM District Manager's responsibilities are to:
>
> 1. Examine resource values and develop appropriate surface protection and reclamation measures.
>
> 2. Conduct compliance inspections.
>
> 3. Complete final inspection after the Notice of Completion is filed. The inspection must determine that all instructions were complied with and all rehabilitation practices completed. A 90-day limit for the final inspection and notification of additional work is established by regulation. If further instructions are given to the operator after final inspection, a new 90-day limit is established for the BLM after notification by the operator that the work has been completed.

Operations

Once a federal lessee or designated operator indicates that he wishes to explore on or develop a lease, all proposed drilling operations and related surface disturbance activities must be approved before entry upon the lands involved. Standard lease stipulations are listed in Appendix F.

Approval will be in accordance with: (1) lease terms, including any additional lease stipulations, and (2) The appropriate CFR. As of 1984, the requirements that must be approved include the following:

Application for Permit to Drill. Prior to drilling (or road construction) on a federal lease, the operator must submit an Application for Permit to Drill (APD). The APD includes a Surface-Use and Operations Plan. Where private surface is involved, it should include a copy of the written agreement between the lessee or operator and the surface owner. A letter from the lessee or operator setting forth rehabilitation requirements agreed to with the surface owner is acceptable.

The APD provides operational and geologic information required by the BLM. The Surface-Use and Operations Plan must allow assessment of the environmental effects expected from the proposed project. Bonding coverage must be obtained by the applicant before approval of the APD by BLM.

BLM prepares surface-protection stipulations for the approved permit. The BLM must decide at this time if it desires to obtain the well as a water well if oil or gas is not encountered in usable quantities.

Approval of Operations. Before repairing, deepening, or conditioning an existing well, a detailed written work plan must be submitted to BLM.

In existing fields, operators are required to submit, for BLM approval, plans for new construction, reconstruction, or alteration of existing facilities when additional surface disturbance will result.

Abandonment. Well Abandonment requires prior approval by the BLM, which may require additional surface rehabilitation. These requirements are normally part of the approved abandonment plan. Abandonment will not be approved until surface rehabilitation work required by the drilling permit or abandonment notice is complete, and required vegetation is established to the satisfaction of the BLM District Manager.

Water Well Conversion. If the BLM decides to acquire the well as a water well, it must assume responsibility at the time of abandonment. The operator will plug the well at the bottom of the desired fresh-water zone and leave casing in place. The operator then will begin surface cleanup as required. The BLM must reimburse the operator for all costs in excess of the normal plugging costs.

Important resource values would be protected from undue degradation caused by oil and gas exploration and development. However, it is impractical to mitigate impacts on a site-by-site basis in the RMP due to the geographic scope of this assessment. Consequently, many of the mitigating measures in the Programmatic

Environmental Assessment will not apply to all sites. Instead, these measures apply to those areas exhibiting environmental features that are Sensitive or Critically Sensitive to oil and gas activity (e.g. fragile soils, endangered species, etc.). All new leases would be issued by the Montana State Office with only Standard Stipulations attached for land classified as nonsensitive. Additional stipulations to minimize damage from development would be added to land areas classified as sensitive.

Current sensitive or special stipulation areas include: Fort Meade Recreation Area, Belle Fourche Reservoir, Belle Fourche Airport, and Missouri River Area. These areas encompass about 7,000 acres of federal surface oil or minerals.

In the Resource Area, stipulations at the time of lease are proposed by area personnel. The Surface Protection Specialist and Resource Specialists attach mitigation to individual drilling permits at the time of the predrill inspection by utilizing the range of measures proposed in the Programmatic EA necessary to protect the features found in the area.

Appendix F presents the existing standard BLM stipulations package. This package represents an effort to develop a listing of the most often used mitigating measures. For that reason, the reader should note that Appendix F does not contain a complete listing of mitigating measures.

Special lease stipulations limit the lessee's normal enjoyment of the lease. Examples are when portions of the lease cannot be occupied or cannot be used during certain parts of the year for wildlife, watershed, or other reasons or when certain roads cannot be used, etc., or when special situations are evident at the time of lease issuance which will require unique or unusually expensive steps by the lessee. Some special situations could involve extremely unstable formations, extremely high pressure water flows, or identified critical habitat for threatened or endangered species.

Stipulations for normal environmental situations such as access road location, design, and construction; construction materials; drill site and development facilities layout and construction; waste disposal; water supply; and protection or recovery of cultural resources; proper engineering techniques; visual resource considerations; steps necessary for quick and successful reclamation, wildlife habitat protection, facility location, required soil or water testing; etc., will be covered during the lease development stage in the Application for Permit to Drill (APD) required by Operating Order No. 1 and Operating Plan required by Notice to Lessees (NTL) No. 6.

Methods of seedbed preparation and seed mixtures can be left open until the time the actual rehabilitation operation is begun. However, where special species such as hard to find native seed, special seedings, or tree or shrub planting are anticipated, it should be stipulated at the time of approval of the Application for Permit to Drill.

The Programmatic Oil and Gas EA is used as a general guide. The need for using special stipulations must be supported by site specific analysis. This documentation will be included in the lease file.

APPENDIX E: OIL AND GAS LEASING PROGRAM IMPACT SUMMARY

Proposed Action

The following summary presents the impacts considered most significant within each environmental component as a result of the Resource Area's oil and gas leasing program (proposed action) as summarized in the Management Guidance Common to All Alternatives section in Chapter 2 of this RMP. The reader may refer to the environmental impact assessment in Chapter 2 of the Miles City District Oil and Gas EA for a detailed analysis. That document is on file at the Miles City District Office.

Geology

Impacts could occur on paleontological features within the study area resulting from the full range of surface disturbing actions associated with oil and gas activities.

Soils

Impacts would result in certain areas depending upon slope, rainfall, inherent soil characteristics, and vegetative cover. Soil productivity would be lessened from compaction, use of inferior fill material and spillage of fuel, drilling fluids, and crude oil.

Topography

No significant impacts are expected.

basements. Dwellings with basements. Small commercial buildings. Local roads and streets.

Classification of the soils

Family or higher taxonomic class. Academic interest.

Construction materials

Roadfill. Sand. Gravel. Topsoil.

Engineering properties and classifications

Depth. USDA texture. Classification—Unified. AASHTO. Fragments greater than 3 inches. Percentage passing sieve number—4, 10, 40, 200. Liquid limit. Plasticity index.

Engineering test data

Classification—AASHTO. Unified. Grain size distribution. Liquid limit. Plasticity index. Moisture density—Maximum density. Optimum moisture.

Freeze dates in spring and fall.

Temperature. Growing season length. Daily minimum temperature during growing season.

Physical and chemical properties of soils

Depth. Permeability. Available water capacity. Soil reaction. Salinity. Shrink-swell potential. Risk of corrosion—Uncoated steel. Concrete. Erosion factors.

Rangeland productivity and characteristic plant communities

Range site name. Total production—Kind of year. Dry weight. Characteristic vegetation. Composition.

Recreational development

Camp areas. Picnic areas. Playgrounds. Paths and trails.

Sanitary facilities

Septic tank absorption fields. Sewage lagoon areas. Trench sanitary landfill. Area sanitary landfill. Daily cover for landfill.

Soil and water features

Hydrologic group. Flooding—Frequency, Duration, Months. High water table—Depth, Kind, Months. Bedrock—Depth, Hardness. Potential frost action.

Temperature and precipitation data

Temperature. Precipitation.

Water management

Pond reservoir areas. Embankments, dikes, and levees. Drainage irrigation. Terraces and diversions. Grassed waterways.

Wildlife habitat potentials

Potential for habitat elements—Grain and seed crops. Grasses and legumes. Wild herbaceous plants. Hardwood trees. Wetland plants. Shallow water areas. Potential as habitat for—Openland wildlife, Wetland wildlife, Rangeland wildlife.

Windbreaks and environmental plantings

Trees having predicted 20-year average heights in feet of—Less than 8, 8-15, 16-25, 26-35.

Yields per acre of crops and pasture

Corn. Oats. Spring wheat. Winter wheat. Alfalfa hay. Cool season grass.

Source: Information is common to most published soil surveys.

APPENDIX I: SOUTH DAKOTA SOIL SURVEY STATUS

(MAJOR PUBLIC LAND AREAS)

County	Published	Field Work Completed	Field Work Ongoing
Butte	X		
Brule	X		
Custer			X
Fall River	X		
Harding		X	
No. Meade		X	
So. Meade	X		
Pennington			X
Perkins	X		
Stanley	X		

APPENDIX J: RANGELAND MECHANICAL TREATMENT GUIDE

When it has been determined that grazing management systems cannot reach desired goals in a realistic time, mechanical treatments with good grazing management practices can be considered.

The following information will be useful in selecting appropriate land treatments.

Pros and Cons of Rangeland Mechanical Treatment and Fertilization

The following conclusions on rangeland mechanical treatment and fertilization are drawn from: (1) Research; (2) Field observations; and (3) Ranchers' experience.

These treatments are designed to improve livestock grazing, watershed condition, wildlife habitat and recreation. These mechanical treatments result in long-term benefits of 20 years, or more.

Mechanical Treatments

Scalping and Furrowing

Advantages

1. Increases vegetative production, diversity and vigor.
2. Reduces runoff — captures moisture on site.
3. Increases soil moisture available for plant growth.
4. Provides forage during drier years.
5. Provides opportunities for seeding.
6. Improves vegetative ground cover.
7. Improves water quality.

Disadvantages

1. Livestock and wildlife dislike traversing furrows.
2. Extra forage may not be used if animals have another grazing choice.
3. May cause overuse of untreated areas in same pasture.
4. Reduces runoff into reservoirs.
5. Livestock can be trapped when lying down.
6. Equipment is not available to many ranchers.
7. Equipment and maintenance costs are high.
8. Labor intensive; extra care must be taken to lay out furrows on contour.
9. Restricts vehicle use.

Chiseling

Advantages

1. Increases vegetative production, diversity and vigor.
2. Equipment is available to many ranchers.
3. Movement of vehicles, livestock and wildlife are only slightly altered.
4. Increases soil moisture for plant growth.
5. Increases vegetative ground cover.
6. Easy to lay out and complete—exact contour is not necessary.
7. Chiseling equipment is flexible, shovel size, and nature of shank (straight or twisted) can be selected for soil and vegetation conditions.

Disadvantages

1. May be less productive (10-15%) than scalping or furrowing on most sites.
2. May require two passes to reach desired soil and vegetative disturbance, thus costs may be increased.

Prescribed Fire and/or Modified Suppression

Advantages

1. Reduce, control, or eliminate undesirable grasses, trees or shrubs.
2. Controls insects and diseases.
3. Increases desirable grass species.
4. Provide opportunity for reseeding; natural or mechanical.

Disadvantages

1. Increases rates of soil erosion and decreases water quality.
2. Increases soil temperature extremes.
3. Initial loss of vegetative productivity.
4. Requires a minimum of one growing season rest.

5. Reduces soil moisture levels.

6. Limited value on poorly managed, low condition class prairie rangelands of the Northern Great Plains.

Range Fertilization

Advantages

1. Increases vegetative production.

2. Increases nutrition and palatibility of forage.

3. Draws animals into areas not ordinarily used.

4. Increases vegetative ground cover reducing runoff and erosion.

Disadvantages

1. Management needs are increased to prevent the following problems:

    a. Vegetation tends to go to monoculture (favoring most vigorous species).

    b. Undesirable vegetative species may increase due to overuse of more palatable species.

    c. Vegetation and soils on small fertilized areas may be damaged due to concentration of animals.

2. Ecological condition may decrease.

Suitability Guide for Rangeland Mechanical Treatments

The following guide has been developed by BLM Soil Scientists, and other specialists, for use on Montana and Dakota public lands.

Mechanical treatments may be considered as an alternative method of increasing vegetative production and improving watershed condition. Treatment feasibility should be considered where grazing management systems cannot reach desired goals in a realistic time.

Factors influencing feasibility of treatments are: (1) soil properties, (2) existing plant community, (3) objectives of treatment, (4) anticipated response from treatment, (5) economics, (6) availability of equipment, (7) conditions that influence operation of equipment.

The objectives of mechanical treatment should be carefully analyzed. It may be desirable to: (1) change existing vegetation (i.e., reduce clubmoss-blue grama dominance) and/or (2) correct a soils problem (i.e., breakup of claypan or compacted layer). Vegetation can be changed to improve range condition or to maximize production. Treatment should be selected to best reach the desired objective.

To use the table, first consider each factor in the left column independent of others, then consider interrelated factors to reach a final rating. These are evaluated in the following table.

Relevant conditions not evaluated in the table must also be considered. For example, kinds of bedrock (i.e., consolidated, fractured, etc.) will influence suitability for mechanical treatments. Aspect will influence the amount of moisture available for plant use.

Treatment effect upon water infiltration and runoff is an important consideration. Many treatments will increase infiltration and reduce runoff; but less runoff may not be desirable in cases where downstream use of water has a higher priority.

Wildlife Considerations

Mechanical treatment of sagebrush land should not be done on sage grouse or sharptail strutting grounds, or on nesting or other special use areas. No vegetal control should be attempted along streams, meadows or secondary drainages (dry and intermittent) unless done as part of a planned meadow rehabilitation effort. Normally, a buffer strip of living sage should be retained on each edge of meadows and drainages. Onsite inspections by wildlife personnel should be made to determine these.

Projects to control sagebrush should be designed in irregular patterns. Design should consider natural terrain, vegetative types, brush density, sage grouse special use areas and other habitat needs. No large blocks of sagebrush should be treated in occupied sage grouse range, or on antelope or deer winter range.

SUITABILITY GUIDE FOR RANGELAND MECHANICAL TREATMENT[1]

Sedimentary Plains, Mountains, and Foothills
10 to 14 Inch PZ

Property Affecting Use	Chiseling or Scalping Suited	 Unsuited	Contour Furrowing Suited	 Unsuited	Plowing and Seeding Suited	 Unsuited
Slope	≤15%	>15%	≤15%	>15%	≤8%	>8%
Depth to Bedrock (Paralithic)[2]	≥20″	<20″	≥20″	<20″	≥20″	<20″
Calcium Carbonate[3]	≤ es	≥ ev	≤ e	≥ es	≤ e	≥ es
Texture of Surface Layer[3]	All textures except cos, s, fs, lfs, ls	cos, s, fs, lfs, ls	All textures except cos, s, fs, lfs, ls	cos, s, fs, lfs, ls	All textures except cos, s, fs, lfs, ls	cos, s, fs, lfs, ls
Coarse Fragments in Surface Layer; (vol.)						
Gravel + Cobbles	≤35%	≥35%	<35%	>35%	≤35%	>35%
Stones + Boulders	< 3%	> 3%	≤ 3%	> 3%	< 3%	> 3%
Salts (mmhos/cm)[3]	< 12	≥ 12	< 12	≥ 12	≤ 4	> 4
SAR[3]	< 12	≥ 12	< 12	≥ 12	≤ 4	> 4
Structure of Surface Layer	All except those in unsuited.	Single grained w/coarse texture or > 40% clay w/massive or vesicular crust.	All except those in unsuited.	Single grained w/coarse texture or > 40% clay w/massive or vesicular crust.	All except those in unsuited.	Single grained w/coarse texture or > 40% clay w/massive or vesicular crust.
Flooding Hazard	None to occasional	Frequent	None to occasional	Frequent	None to occasional	Frequent
Drainage Class	All except those in unsuited.	Excessively drained; poor or very poorly drained.	All except those in unsuited.	Excessively drained; poor or very poorly drained.	All except those in unsuited.	Excessively drained; poor or very poorly drained.
Tree Canopy Cover	<10%	>10%	<10%	>10%	0	> 0

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[1] An on-site examination is necessary to determine if the landscape is suited for specific kinds of mechanical treatments, e.g., are shallow soils, steep slopes, or dissection in the landscape as limiting factors.

[2] Unconsolidated when moist.

[3] Applies to surface layer (upper 6 to 8 inches).

SUITABILITY GUIDE FOR RANGELAND MECHANICAL TREATMENT[1]

Sedimentary Plains, Mountains, and Foothills
15 to 19 Inch PZ

	Chiseling or Scalping		Contour Furrowing		Plowing and Seeding	
Property Affecting Use	**Suited**	**Unsuited**	**Suited**	**Unsuited**	**Suited**	**Unsuited**
Slope	≤15%	>15%	≤15%	>15%	≤15%	>15%
Depth to Bedrock (Paralithic)[2]	≥20″	<20″	≥20″	<20″	≥20″	<20″
Calcium Carbonate[3]	≤ es	≥ ev	≤ e	≥ es	≤ e	≥ es
Texture of Surface Layer[3]	All textures except cos, s, fs, lfs, ls	cos, s, fs, lfs, ls	All textures except cos, s, fs, lfs, ls	cos, s, fs, lfs, ls	All textures except cos, s, fs, lfs, ls	cos, s, fs, lfs, ls
Coarse Fragments in Surface Layer; (vol.)						
Gravel + Cobbles	≤35%	≥35%	≤35%	>35%	≤35%	>35%
Stones + Boulders	< 3%	≥ 3%	< 3%	> 3%	< 3%	> 3%
Salts (mmhos/cm)[3]	< 12	> 12	< 12	≥ 12	≤ 4	> 4
SAR[3]	< 12	> 12	< 12	≥ 12	≤ 4	> 4
Structure of Surface Layer	All except those in unsuited.	Single grained w/coarse texture or > 40% clay w/massive or vesicular crust.	All except those in unsuited.	Single grained w/coarse texture or > 40% clay w/massive or vesicular crust.	All except those in unsuited.	Single grained w/coarse texture or > 40% clay w/massive or vesicular crust.
Flooding Hazard	None to occasional	Frequent	None to occasional	Frequent	None to occasional	Frequent
Drainage Class	All except those in unsuited.	Excessively drained; poor or very poorly drained.	All except those in unsuited.	Excessively drained; poor or very poorly drained.	All except those in unsuited.	Excessively drained; poor or very poorly drained.
Tree Canopy Cover	< 10%	> 10%	< 10%	> 10%	< 10%	> 10%

[1] An on-site examination is necessary to determine if the landscape is suited for specific kinds of mechanical treatments, e.g., are shallow soils, steep slopes, or dissection in the landscape as limiting factors.

[2] Unconsolidated when moist.

[3] Applies to surface layer (upper 6 to 8 inches).

SUITABILITY GUIDE FOR RANGELAND MECHANICAL TREATMENT[1]

Glaciated Plains
10 to 14 and 15 to 19 Inch PZ

Property Affecting Use	Chiseling or Scalping		Contour Furrowing		Plowing and Seeding	
	Suited	Unsuited	Suited	Unsuited	Suited	Unsuited
Slope	≤ 15%	> 15%	≤ 15%	> 15%	≤ 15%	< 15%
Depth to Bedrock (Paralithic)[2]	≥ 20″	< 20″	≥ 20″	< 20″	≥ 20″	> 20″
Texture of Surface Layer[3]	All textures except cos, s, fs, lfs, s	cos, s, fs, lfs, ls	All textures except cos, s, fs, lfs, ls	cos, s, fs, lfs, ls	All textures except cos, s, fs, lfs, ls	cos, s, fs, lfs, ls
Coarse Fragments in Surface Layer; (vol.)						
Gravel + Cobbles	≤ 35%	> 35%	≤ 35%	> 35%	≤ 35%	> 35%
Stones + Boulders	< 3%	> 3%	< 3%	> 3%	< 3%	> 3%
Salts (mmhos/cm)[3]	< 12	≥ 12	< 12	≥ 12	≤ 4	> 4
SAR[3]	< 12	≥ 12	< 12	≥ 12	≤ 4	> 4
Structure of Surface Layer	All except those in unsuited.	Single grained w/coarse texture or > 40% clay w/massive or vesicular crust.	All except those in unsuited.	Single grained w/coarse texture or > 40% clay w/massive or vesicular crust.	All except those in unsuited.	Single grained w/coarse texture or > 40% clay w/massive or vesicular crust.
Flooding Hazard	None to occasional	Frequent	None to occasional	Frequent	None to occasional	Frequent
Drainage Class	All except those in unsuited.	Excessively drained; poor or very poorly drained.	All except those in unsuited.	Excessively drained; poor or very poorly drained.	All except those in unsuited.	Excessively drained; poor or very poorly drained.
Tree Canopy Cover	0	> 0	0	> 0	0	> 0

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[1] An on-site examination is necessary to determine if the landscape is suited for specific kinds of mechanical treatments; e.g., are shallow soils, steep slopes, or dissection in the landscape as limiting factors.

[2] Unconsolidated when moist.

[3] Applies to surface layer (upper 6 to 8 inches).

SELECTION OF LAND TREATMENT BY RANGE SITE

(Montana BLM — September 1984)

In addition to the interpretation guide on the suitability of soils and related factors for rangeland mechanical treatment, it may be helpful to consider the selection of land treatment according to range sites.

The following table shows the type of treatment (mechanical, burning or chemical) suited to correct common soil or vegetation problems found on certain range sites. Where two or more vegetation or soil problems are present (dense sagebrush on claypan soils) select the treatment that will solve both problems; the claypan problem can't be reduced just by burning sagebrush. Range sites not shown in the table are generally unsuited to mechanical treatments.

Note that vegetative changes can be accomplished with fire, chemicals or a surface layer treatment (i.e., chiseling) but to correct a subsoil problem may require a deeper treatment (i.e., furrowing or ripping).

Additional factors must be considered to determine the final suitabiliy of a site for mechanical treatment. These factors are in the foregoing section, on rating soil properties and related factors. The narrative discusses objectives of a treatment.

Finally, land treatments cannot be considered an alternative to good management practices, but will require a high level of management following the treatments.

GUIDE TO TREATMENT SELECTION BY DOMINANT RANGE SITES[1]

Vegetation or Soil Problem	Thin Claypan or Claypan	Clayey	Dense Clay	Overflow[2]	Sandy	Silty
Blue grama and/or clubmoss	A4, A2, A1, A3 C1, C3, C2 D1, D2	A3, A2, A1 B1, B3, B2 D1, D2	N/A	A1, A2, A3, A4 D1, D2	A3, A2, A1 D1, D2	A3, A2, A1 B1, B3, B2 D1, D2
Claypan	A4, A2, A1, A3 C1, C3, C2 D1, D2	N/A	N/A	N/A	A4 D1, D2 E	N/A
Surface layer compaction Less than 8″ deep	A3, A2, A1 B1, B3 D1	A3, A2, A1 B1, B3, B2 D1, D2	A2, A1 C1, C3	A2, A1, A3 D1	A3, A2, A1 D1, D2	A3, A2, A1 B1, B3, B2 D1, D2
Subsoil compaction below 8″ deep	A4 C1, C3 E	A4 C1, C2, C3 D1, D2	N/A	A4 D1	N/A	A4
Dense big sagebrush (30% canopy cover)	E, G D2	E, G D2	E, G	N/A	N/A	E, G D2
Weedy or nearly barren areas	C2 D2, D1	D1, D2 B2, B1 C2 A2, A3, A1	A2, A1 C2	A2, A3 D1, D2	D1, D2	D1, D2 B2 C2
Borrow areas	D1, D2 F	D1, D2 F	D1, D2 F	D1, D2 F	D1, D2 F	D1, D2 F

[1] Make choice of treatments based on range condition, planned grazing system, available equipment, desire of permittee and benefit/cost. The order of listed options may be changed based on local conditions.

These range sites are dominant in the treatment area.

[2] Includes loamy and clayey phases of overflow.

NOTE: Fertilizer is a tool that can be used to encourage better livestock distribution in addition to other uses.

KEY TO TREATMENTS ON RANGELAND

A Chiseling at 4-6 inch depth
  - A1 Using straight shanks - 2 operations (last on contour)
  - A2 Using twisted shanks - 2 operations (last on contour)
  - A3 Using 6-inch shovels (sweeps) - 1 operation (on contour)
  - A4 Deep chiseling at 6-10 inch depth - 2 operations (last on contour)

B Contour scalping at 2-4 inch depth
  - B1 Interseed with alfalfa
  - B2 Interseed with grass and alfalfa
  - B3 No interseeding

C Contour furrowing at 4-10 inch depth
  - C1 Interseed with alfalfa
  - C2 Interseed with grass and alfalfa
  - C3 No interseeding

D Seedbed preparation and seeding
  - D1 Two operations with chisel, then third operation with drill attached.
  - D2 Plow and seed.

E Burning

F Fertilizing

G Chemical

Source: BLM, MT-MCDO 9/84

APPENDIX K: METHODOLOGY FOR ASSESSING RANCH RELATED ECONOMIC IMPACTS

Each M or I allotment was matched with the respective ranch operation. Some ranch operations may have more than one public grazing allotment. These operations are listed by record number in Appendix B.

There are a total of 66 operations in the M or I categories with public grazing lands. This analysis includes all 66 operations. These operations were placed into four ranch size classes based on total acreage. The small operation size is 0 to 3,500 acres, the medium size operation ranges from 9,001 to 14,000 acres and very large operations are 14,001 acres and above. The dependency of an operation is the quotient of acres of public land and acres of total land expressed as a percentage. Four dependency groups were established: 0-15%, 16% to 30%, 31% to 45%, and 46% and greater. The operations were placed in the appropriate strata of size class and dependency group.

Each alternative, except, which has no change, was reviewed to determine the number of ranches that may possibly have a change in AUMs. Changes occurred only in the long term. For each alternative, the number of operations that have an increase, decrease or no change are calculated. (See Tables K-1 through K-4.)

To determine the magnitude of change, the percentage change in AUMs was multiplied by the percent dependency on public lands. All changes over 10 percent were considered significant. All other reductions or increases are considered insignificant. The results are presented in the text for each alternative.

Gross revenue analysis has been based on $400 per animal unit. This value was derived from 1982 Census of Agriculture data for South Dakota.

Net revenue is the difference between total revenue and total costs. Net revenue can be estimated by developing budgets of total revenues and costs for typical ranch operations. Net analysis in this document uses the concept of ranch income. Ranch income is gross revenues minus cash costs and depreciation. This represents the returns to a ranch operator for family labor, entrepreneurial skill and investment. For ranch budgets developed for the region, average ranch income ranges between approximately $40 and $120 per brood cow.

It is difficult to project how individual operators would respond to a change in BLM AUMs. However, it will be assumed that the ranch income associated with BLM AUMs is approximately $10 per AUM.

TABLE K-1

ALTERNATIVE PREFERRED DEPENDENCY

	Ft. Meade			0 to 15%			16 to 30%			31 to 45%			46% and greater		
Operation	—	0	+	—	0	+	—	0	+	—	0	+	—	0	+
Small		1						2	5	2		1	1		3
Medium		1			1	1	4	4	7	3					
Large					5	2	2	1	1			1			1
Very Large				3		1	4	1	4	1			1	1	1

0 = No Charge

Source: BLM, 1985

TABLE K-2

ALTERNATIVE B DEPENDENCY

	Ft. Meade			0 to 15%			16 to 30%			31 to 45%			46% and greater		
Operation	—	0	+	—	0	+	—	0	+	—	0	+	—	0	+
Small			1						6	3		1	1		3
Medium			1	1		2	10		5	1		1			
Large				4		4	3			1				1	
Very Large				3		1	6		3	1			2		1

0 = No Charge

Source: BLM, 1985

TABLE K-3
ALTERNATIVE C DEPENDENCY

	Ft. Meade			0 to 15%			16 to 30%			31 to 45%			46% and greater		
Operation	—	0	+	—	0	+	—	0	+	—	0	+	—	0	+
Small			1						6			4	1		3
Medium			1	1		2	5		9	2		1			
Large				2		6	2		1			1			1
Very Large				3		1	4		5	1			2		1

0 = No Charge

Source: BLM, 1985

TABLE K-4
ALTERNATIVE D DEPENDENCY

	Ft. Meade			0 to 15%			16 to 30%			31 to 45%			46% and greater		
Operation	—	0	+	—	0	+	—	0	+	—	0	+	—	0	+
Small			1						6	2		2	1		3
Medium			1	1		2	5		9	2		1			
Large				2		5	2		2			1	1		
Very Large				3		1	5		4				3		1

0 = No Charge

Source: BLM, 1985

APPENDIX L: COAL LEASING AND LICENSING

Federal mineral ownership includes coal deposits (lignite) in northwestern South Dakota. Rights to coal, a leasable mineral, can be obtained through competitive leasing or licensing.

Leasing

Historically, there has been no substantive industry interest in leasing federal coal in South Dakota. This area is not a part of the Ft. Union or any other designated federal coal production region.

Any potential federal coal leasing in the state would be governed by the leasing portion of the federal coal management regulations (43 CFR 3425). Under these regulations, interested parties apply for a coal lease to the BLM, Montana State Office, Billings, Montana. The area applied for would be studied for suitability, utilizing the four planning screens which are: (1) Verification of coal development potential; (2) Application of the 20 unsuitability criteria; (3) Surface owner consultation (for split-estate lands); and (4) Multiple-use tradeoffs (other resource values are compared to the coal values). Application of these screens would constitute an amendment to this RMP and would be subject to gubernatorial and public review. Areas studied would be designated as suitable or not suitable for further consideration for leasing. Assuming that some areas were found to be suitable (with or without additional stipulations on mining and reclamation), the applicant maintained interest, and positive evidence of surface owner consents were provided then the "cleared" lands could be offered for competitive lease by the Secretary of the Interior.

Coal operators must comply with all federal and state laws and regulations dealing with coal mining and reclamation.

Licensing

BLM regulations (43 CFR 3440) provide for the issuances of coal mining licenses to municipalities for home heating use and to individuals and entities for use with limitations. Licenses are also issued under 43 CFR 3410 for coal exploration operations. Exploration operations must comply with all state and federal coal exploration regulations. Licensing can occur without an amendment to this RMP.

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GLOSSARY

ACCELERATED EROSION. Erosion processes increased by the activities of man. See "Erosion."

ACRE-FOOT. A unit for measuring volume, equal to the quantity of water or other material required to cover one acre to a depth of one foot or a volume of 43,560 cubic feet.

ACTIVITY PLAN. A plan which establishes objectives and prescribes management for a specific site. It may include one or more activities or resources. (Allotment Management Plan, Habitat Management Plan, Coordinated Resource Management Plan, etc.).

ACTUAL USE. (1) The actual amount of grazing by livestock and/or game animals; (2) The index of actual use submitted by livestock operators (No.s, class of stock, season) expressed in AUMs.

ADJUSTMENTS. Changes in animal numbers, seasons of use, kinds or class of animals or management practices as warranted by specific condition.

ALLOTMENT. An area of land where livestock operators graze their livestock.

ALLOTMENT MANAGEMENT PLAN (AMP). A written program of livestock grazing management, including supportive measures if required, designed to attain specific management goals in a grazing allotment. (See Activity Plan.)

ALLUVIAL SOIL. A soil developing from recently deposited alluvium and showing essentially no development of layers or modification of the recently deposited materials.

ALLUVIUM. Soil and rock debris deposited by streams.

ANIMAL UNIT (AU). Considered to be mature (1000 lb.) cow or the equivalent, based on an average consumption of 26 lbs. of dry forage per day (800 lb./month).

ANIMAL UNIT MONTH (AUM). (1) The amount of forage necessary for sustenance of one animal unit for one month; (2) The measurement of the privilege of grazing one animal unit for one month; (3) 800 pounds of vegetation apportioned to uses other than livestock.

APPORTIONMENT. Dividing or sharing according to a plan. The act of dividing or apportioning vegetation production among resources activities (Syn. allocation).

AQUIFER. A rock formation, group of rock formations or part of a rock formation that con-

tains enough water-saturated permeable material to yield water to a spring or well.

AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC). Area within public lands where special management attention is required to protect and prevent irreparable damage to important cultural, historical, or scenic values, fish or wildlife resource, or other natural system or processes, or to protect life and safety from natural hazards.

ASPECT. The orientation of a slope with respect to the compass; a position facing or fronting a particular direction; also, the visual first impression of vegetation at a particular time or as seen from a specific point.

BEDROCK. The solid unweathered rock underlying soils.

BROWSE. (Verb) to search for or consume browse. (Noun) is the part of shrubs, woody vines and trees available for animal consumption.

CANOPY COVER. The percentage of ground covered by vertical projection of the outermost perimeter of the natural spread of foliage of plants. Small openings within the canopy are included. It may exceed 100 percent (Syn. crown cover).

CATEGORIZATION. The process of grouping allotments with similar characteristics (ownership, productivity, size, resource conditions) into one of three categories; Maintain, Improve, Custodial.

Maintain Category: An allotment category which includes allotments which are: generally in good condition, without significant resource problems or conflicts and which have good production potential.

Improve Category: An allotment category which includes allotments which have: resource problems or conflicts, good production potential, and enough public land to be manageable.

Custodial Category: An allotment category which includes allotments which generally have little public land, or the public land is a minor portion of the allotment, or the public land potential is low.

CHISELING. Shallow tillage of the range to speed range improvement by increasing infiltration and reducing competition to desirable species from a dense stand of less desirable vegetation.

CLAYEY. A soil containing more than 35% clay. The textural classes are sandy clay, silty clay, clay, clay loam and silty clay loam.

CLAYPAN. A dense, compact layer in the subsoil having a much higher clay content than the overlying material from which it is separated by a sharply defined boundary.

CLIMAX. The highest ecological development of a plant community capable of perpetuation under the prevailing climatic and soil conditions.

COMPACTION. The process of packing firmly and closely together; the state of being so packed, e.g., mechanical compaction of soil by livestock or vehicular activity. Soil compaction results from particles being pressed together so that the volume of the soil is reduced. It is influenced by the physical properties of the soil, moisture content and the type and amount of compactive effort.

CONTOUR FURROW. A plowed strip on the contour of the land for water retention.

CRUCIAL WILDLIFE HABITAT. Parts of the habitat necessary to sustain a wildlife population at critical periods of its life cycle. This is often a limiting factor on the population, such as breeding habitat, winter habitat, etc.

CULTURAL RESOURCES. A term that includes items of historical, archaeological or architectural significance which are fragile, limited and non-renewable portions of the human environment.

CULTURAL SITE. Any location that includes prehistoric and/or historic evidence of human use.

DEFERMENT. The withholding of livestock grazing to provide for plant reproduction, establishment, or vigor recovery.

DEFERRED GRAZING. The use of deferment in grazing management.

DEFERRED ROTATION GRAZING. Deferment of livestock grazing on various parts of a range in succeeding years; systematic rotation of grazing deferment among pastures.

DETENTION DAM. A dam constructed for the temporary storage of flood flows where the release opening is of fixed capacity and is not manually operated.

DISTRIBUTION. The uniformity of livestock grazing over a range area.

Distribution is affected by the availability of water, topography and type and palatability of vegetation as well as other factors.

ECOLOGICAL RANGE CONDITION CLASSES. Four classes used to express the degree to which the composition of the present plant community reflects that of climax. (See Range Condition). They are:

"Condition Class"	Percentage
Excellent	76-100
Good	51-75
Fair	26-50
Poor	0-25

ELIMINATION OF GRAZING. Relinquishment or cancellation of livestock grazing on public lands currently being grazed by livestock.

ENDANGERED OR THREATENED SPECIES. Determined for plants and animals by one or a combination of the following factors:

1. The present or threatened destruction, modification or curtailments of a species habitat or range.
2. Over-utilization of a species for commercial, sporting, scientific or education purposes.
3. Disease or predation of the species.
4. The inadequacy of existing regulatory mechanisms.
5. Other natural or human caused factors affecting a species' continued existence.

ENVIRONMENTAL IMPACT STATEMENT (EIS). A written analysis of the impacts on the environment of a proposed action.

EPHEMERAL STREAM. A stream that flows only after rains or during snowmelt.

EROSION. The wearing away of the land surface by running water, wind, ice or other geological agents.

EROSION CONDITION CLASSES. Expression of current erosion activity by use of the following ratings (soil surface factor): stable, 0-20; slight, 21-40; moderate, 41-60; critical, 61-80; severe, 81-100.

EROSION SUSCEPTIBILITY. The susceptibility of a soil to erosion when no cover is present. The rate of soil displacement depends on the physical properties of the soil, rainfall intensity and slope gradient.

FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976 (FLPMA). Public Law 94-579, October 21, 1976, often referred to as the BLM's "Organic Act," which provides the majority of the BLM's legislated authority, direction, policy and basic management guidance.

FLOODPLAIN. The relatively flat area or lowland adjoining a drainage.

FORB. A broadleafed herb that is not grass, sedge or rush.

GRAZING SYSTEM. The manipulation of livestock grazing to accomplish a desired result.

GROUND COVER. The percentage of material, other than bare ground, covering the land surface. It may include live and standing dead vegetation, litter, cobble, gravel, stones and bedrock. Ground cover plus bare ground would total 100 percent.

GROUNDWATER. Water contained in pore spaces of consolidated and unconsolidated subsurface material.

GULLY EROSION. The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to considerable depth, ranging from 0.5 meter (1.6 feet) to as much as 25 to 30 meters (83 to 100 feet).

HABITAT. A specific set of physical conditions that surround a species, group of species or a large community. In wildlife management, the major constituents of habitat are considered to be food, water, cover and living space.

HUNTING HABITAT. Habitat that sustains a significant wildlife population where hunters can expect to locate game.

HYDROLOGY. The science dealing with the behavior of water as it occurs in the atmosphere, on the surface of the ground and underground.

INFILTRATION. The penetration of water into the soil surface through pores of the soil. The rate and amount of infiltration is limited by the size and abundance of pores, organic matter content and the water absorption capacity of the soil.

INTERMITTENT STREAM. A stream which flows most of the time but occasionally is dry or reduced to pool stage.

INTERSEEDING. The practice of seeding native or introduced plant species into native range in combination with various mechanical treatments. Interseeding differs from range seeding in that only part of the native vegetation is removed to provide a seed bed for the seeded species.

LAND CAPABILITY CLASS (LCC). A Soil Conservation Service system where land is classified according to a suitable sustained use that can be made of it while providing for adequate protection from erosion or other means of deterioration.

LANDSCAPE. All natural features such as fields, hills, forests, etc., which distinguish one part of the earth's surface from another part.

LAND TREATMENT. All methods of artificial range/soil improvement and stabilization such as reseeding, brush control (chemical and mechanical), pitting, furrowing, waterspreading, prescribed fire, etc.

LEASE (GRAZING). A document authorizing use of the public lands outside grazing districts under Section 15 of the Taylor Grazing Act for grazing livestock.

LEASE VALUE. The market value of a BLM grazing lease which is often included in the overall market value of the ranch.

LIVESTOCK OPERATION. The management of a ranch or farm so that a significant portion of the income is derived from the continuing production of livestock.

LOAMY. Soil that is intermediate in texture and properties between sandy and clayey soils. Textural classes are sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, sandy clay loam, and clay loam with clay content between 18 and 35 percent.

MANAGEMENT FRAMEWORK PLAN (MFP). A planning decision document that establishes, for a given planning area, land use allocations, coordination guidelines for multiple use, and management objectives to be achieved for each class of land use or protection. It is the BLM's land use plan. AN MFP is prepared in three steps: (1) resource recommendations; (2) impact analysis and alternative development; and (3) decision making.

MAJOR LAND RESOURCE AREA (MLRA). MLRAs are areas delineated on a map of the United States for which similar soils, plants, climate and agricultural use are represented to provide a nationwide geographic basis for organizing research needs and coordinating technical guides for management of natural resources.

MECHANICAL TREATMENTS. Treatment by mechanical means of an area of range including contour furrowing, pitting, plowing and seeding, chiseling, scalping, water spreaders, prescribed fire, etc.

MITIGATION MEASURES. Methods or procedures committed to by BLM for the purpose of reducing or lessening the impacts of an action.

MULTIPLE USE. Balanced management of the various surface and subsurface resources, without permanent impairment of the productivity of the land, that will best meet present and future needs.

NOXIOUS WEED. A weed arbitrarily defined by law as being especially undesirable, troublesome, and difficult to control. Definition of the term varies according to legal interpretations.

OFF-ROAD VEHICLE (ORV). Any motorized tracked or wheeled vehicle designed for cross-country travel over any type of natural terrain.

PAYMENT IN LIEU OF TAXES (PILT). Federal payments to counties based on acres of federal entitlement lands within a county, past revenues derived from those lands and the county population as provided for in Public Law 94-565.

PERCENT OPTIMUM COVER. That percent of soil stabilizing cover consisting of vegetation, rocks, logs, etc.

PREFERENCE (GRAZING). The total number of animal unit months of livestock grazing on public lands apportioned and attached to base property owned or controlled by the operator.

PUBLIC LANDS. Any land and interest in land (outside of Alaska) owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management.

PUBLIC PARTICIPATION. Part of BLM's planning system that provides the opportunity for citizens as individuals or groups to express local, regional, and national perspectives and concerns in the rule making, decision making, inventory and planning processes for public lands. This includes public meetings, hearings, or advisory boards or panels that may review resource management proposals and offer suggestions or criticisms for the various alternatives considered.

RANGE CONDITION. The present state of vegetation of a range site in relation to the climax plant community of that site. it is an expression of the relative degree to which the kinds, proportions and amounts of plants in a plant community resemble that of the climax plant community for that site. Range condition is basically an ecological rating of the plant community. Air-dry weight is the unit of measure used in comparing the composition and production of the present plant community with that of the climax community. (See Ecological Range Condition Classes).

RANGE IMPROVEMENT. Any of a number of facilities or land (e.g., fences, water developments, reseeding, etc.) to increase range production and improve the utilization of the range by grazing animals.

RANGE SEEDING. The process of establishing vegetation by mechanical dissemination of seed.

RANGE SITE. A distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community. A range site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species that differs from that of other range sites in the kind and proportion of species or in total production.

RANGE TREND. The direction of change in range condition observed over time.

RECREATIONAL OPPORTUNITY. Those outdoor recreation activities which offer satisfaction in a particular physical, social and management setting. In the Big Dry EIS area, these activities are primarily hunting, fishing, wildlife viewing, picknicking and, in some areas, boating and camping.

RESIDUAL GROUND COVER. That portion of the total vegetative ground cover that remains after the livestock grazing season. (See Ground Cover and Canopy Cover).

REST ROTATION GRAZING. An intensive system of management where grazing is deferred on various parts of the range during succeeding years, allowing the deferred part complete rest for one year. Two or more units are usually required. Control by fencing is usually necessary on cattle range but may be obtained by herding on sheep ranges.

RIPARIAN AREA. The bank and adjacent areas of water bodies, water courses, seeps and springs whose waters provide soil moisture sufficiently in excess of that otherwise available locally so as to provide a more moist habitat than that of contiguous floodplains and uplands.

RIPPING. The mechanical penetration and shearing of soils to break hardpan layers to facilitate penetration of plant roots, water, organic matter, and nutrients. Used where native grasses of a rhizomatous nature can spread into the ripped soil.

RUNOFF. The water that flows on the land surface from an area in response to rainfall or snowmelt. As used in this EIS, runoff from an area becomes streamflow when it reaches a channel.

SANDY. A soil containing a large amount of sand. Textural classes are sands and loamy sands, with less than 18 percent clay.

SCALPING. Removing 10 to 25 inch wide strips of native vegetation and leaving undisturbed strips between. This mechanical treatment speeds range improvement by retaining rain, water and snowmelt and by reducing competition to desirable species from a dense stand of less desirable vegetation.

SCOPING (PUBLIC). The process for determining the scope of issues addressed and identification of significant issues related to a proposed action. The participation is invited of affected federal, state, and local agencies and affected Indian tribes and other interested persons to participate in this process.

SEASON OF USE. The time of livestock grazing on a range area.

SEASONAL GRAZING. Grazing use throughout a specific season.

SEDIMENT. Soil, rock particles and organic or other debris carried from one place to another by wind, water or gravity.

SEDIMENTATION. The action or process of deposition of material borne by water, wind, or glacier.

SEDIMENTARY ROCK. A rock formed from materials deposited from suspension or precipitated from solution and usually being more or less consolidated. The principal sedimentary rocks are sandstone, shales and limestones.

SEDIMENT YIELD. The total amount of sediment given up by a watershed over a specified time period, usually a year. Ordinarily it is expressed as tons, acre feet or cubic yards of sediment per unit of drainage area per year.

SHEET EROSION. The detachment of soil material from the land surface by raindrop impact and its subsequent removal by runoff.

SHRUB. A plant that has persistent, woody stems and a relatively low growth habit, and that generally produces several basal shoots instead of a single bole. It differs from a tree by its low stature—less than 5 meters (16 feet) and nonarborescent form.

SOIL. The unconsolidated mineral material on the immediate surface of the earth that serves as a natural medium for the growth of land plants.

SOIL LOSS. The detachment of material from the land surface by raindrop impact and its subsequent removal by prechannel or overland flow. Synonymous with "Sheet Erosion."

SOIL MAP. A map showing the distribution of soil series or other soil mapping units in relation to the prominent physical and cultural features of the earth's surface.

SOIL SERIES. The basic unit of soil classification, being a subdivision of a family and consisting of soils which are essentially alike in all major profile characteristics except in the texture of the "A" horizon (or surface layer).

SPRING REST/DEFERMENT. The withholding of livestock grazing in the spring to provide for plant reproduction, establishment or vigor recovery.

STREAMBANK (AND CHANNEL) EROSION. This is the removal and transport of material by concentrated flows.

SURFACE SOIL OR SURFACE LAYER. The uppermost part of the soil, ordinarily moved in tillage, or its equivalent in uncultivated soils and ranging in thickness from 4 to 8 inches. Frequently designated as the "Plow layer," the AP layer or the AP horizon.

TAME PASTURE. Grazing lands, planted to primarily introduced or domesticated native forage species, that receive periodic renovation and/or cultural treatments such as tillage, fertilization, mowing, weed control, and irrigation.

TOTAL DISSOLVED SOILS (TDS or DS). The dry weight of dissolved material, organic and inorganic, contained in water or waste. Dissolved solids cannot be removed by filtration, and excessive dissolved solids makes water unpalatable for drinking and unsuitable for industrial use. Generally reported in mg/1.

VEGETATION (GROUND) COVER. The percent of land surface covered by all living vegetation (and remnant vegetation yet to decompose) within 20 feet of the ground. (See Canopy Cover, Ground Cover, Residual Ground Cover.)

VEGETATION MANAGEMENT. Control or change of the vegetation resource which results from purposeful actions of other activities, i.e., livestock, wildlife management.

VISUAL RESOURCE(S). The land, water, vegetation and animals that comprise the scenery of an area.

WATER QUALITY. The chemical, physical and biological characteristics of water with respect to its suitability for a particular use.

WATERSHED. All lands which are enclosed by a continuous hydrologic drainage divide and lie upslope from a specified point on a stream.

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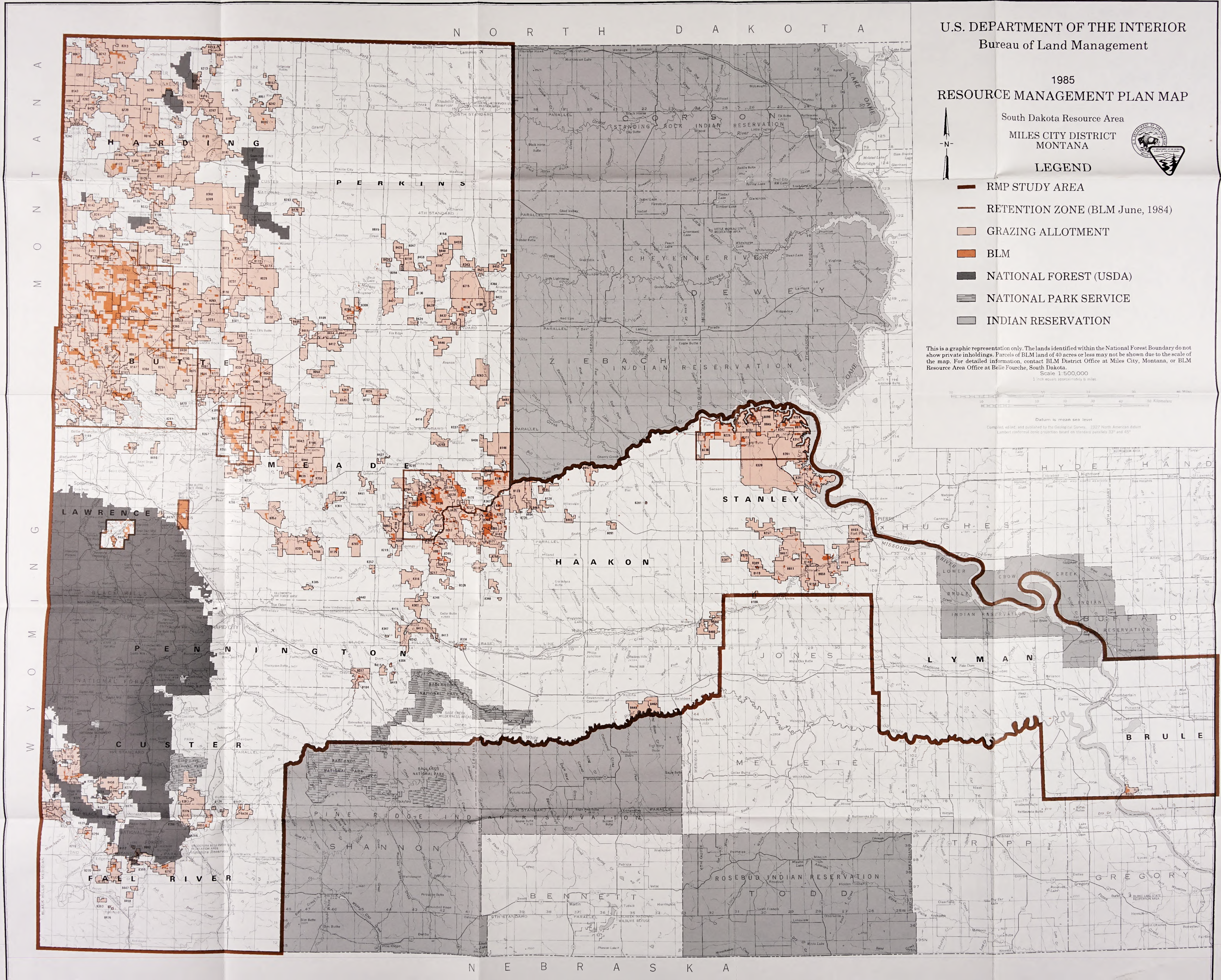

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

1985
RESOURCE MANAGEMENT PLAN MAP

South Dakota Resource Area

MILES CITY DISTRICT
MONTANA

-N-

LEGEND

- RMP STUDY AREA
- RETENTION ZONE (BLM June, 1984)
- GRAZING ALLOTMENT
- BLM
- NATIONAL FOREST (USDA)
- ▤ NATIONAL PARK SERVICE
- INDIAN RESERVATION

This is a graphic representation only. The lands identified within the National Forest Boundary do not show private inholdings. Parcels of BLM land of 40 acres or less may not be shown due to the scale of the map. For detailed information, contact BLM District Office at Miles City, Montana, or BLM Resource Area Office at Belle Fourche, South Dakota.

Scale 1:500,000
1 inch equals approximately 8 miles

10 0 10 20 30 40 Miles
10 0 10 20 30 40 50 Kilometers

Datum is mean sea level

Compiled, edited, and published by the Geological Survey. 1927 North American datum
Lambert conformal conic projection based on standard parallels 33° and 45°

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